

From: Whittaker, Laura [laura.whittaker@aptim.com]
Sent: Thursday, November 1, 2018 6:26 AM
To: Liscio, Matthew P CIV SEA 04, NAVSEA DET RASO [matthew.liscio@navy.mil]
CC: Howard, Leslie A CIV NAVFAC SW [leslie.howard@navy.mil]; Fowler, Janet CIV NAVSEA, SEA 04N [janet.fowler1@navy.mil]; Johnson, Nels [Nels.Johnson@aptim.com]; Schul, Raymond [raymond.schul@aptim.com]; Amy Mangel [amy.mangel@aptim.com]; Hanelt, Norm [Norm.Hanelt@aptim.com]; Killpack, Randall [randall.killpack@aptim.com]; Chi, Minhsec [minhsec.chi@aptim.com]; Orman, Sean [sean.orman@aptim.com]; Rogers, Bryon [bryon.rogers@aptim.com]
Subject: [Non-DoD Source] Data package ready for review - HPNS PE-2, RSY D11 (DC)
Attachments: HPNS APTIM RSY D11 (DC) Soil Non-LLRW Concurrence Request 11012018 (redu....pdf

Mr. Liscio,

APTIM request RASO concurrence to designate this soil as Non-LLRW soil.

If there are any questions or if additional data is required, please contact me.

Thank you.

LAURA WHITTAKER
Radiological Technician 4 (RCT IV)

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Hunters Point Naval Shipyard, Parcel E-2 RSY Data Report

Contract No. EMAC III CTO-0013					
RSY Pad: D11	RSY Pad Use Number: Deconstruction (DC)	First Submittal <input checked="" type="checkbox"/> Second Submittal <input type="checkbox"/>			
Data attached and submitted by: Laura Whittaker		Data Report Submittal Date: 11/01/2018			

Soil Sample Data					
Sample Identification	Survey Location	Type of Sample	²²⁶ Ra Final Analytical Results (pCi/g)	¹³⁷ Cs Final Analytical Results (pCi/g)	Total Sr Final Analytical Results (pCi/g)
		Upper limit of site reference background	1.633	0.113	0.331
PE2-RSYD11-DC-S001	1	Systematic	0.747	0.0343	0.101
PE2-RSYD11-DC-S002	2	Systematic	0.592	0.0334	N/A
PE2-RSYD11-DC-S003	3	Systematic	0.652	0.0284	N/A
PE2-RSYD11-DC-S004	4	Systematic	0.680	-0.0418	N/A
PE2-RSYD11-DC-S005	5	Systematic	0.806	0.0408	N/A
PE2-RSYD11-DC-S006	6	Systematic	0.706	-0.0224	N/A
PE2-RSYD11-DC-S007	7	Systematic	0.493	-0.0797	N/A
PE2-RSYD11-DC-S008	8	Systematic	0.539	0.0117	N/A
PE2-RSYD11-DC-S009	9	Systematic	0.597	-0.00323	N/A
PE2-RSYD11-DC-S010	10	Systematic	0.515	-0.0479	N/A
PE2-RSYD11-DC-S011	11	Systematic	0.551	0.0214	0.234
PE2-RSYD11-DC-S012	12	Systematic	0.586	0.0291	N/A
PE2-RSYD11-DC-S013	13	Systematic	0.841	-0.0337	N/A
PE2-RSYD11-DC-S014	14	Systematic	0.743	0.00357	N/A
PE2-RSYD11-DC-S015	15	Systematic	1.21	-0.0956	N/A
PE2-RSYD11-DC-S016	16	Systematic	0.489	0.0192	N/A
PE2-RSYD11-DC-S017	17	Systematic	0.669	-0.0524	N/A
PE2-RSYD11-DC-S018	18	Systematic	1.07	-0.0635	N/A
Biased Soil Sample Data					
PE2-RSYD11-DC-B-S001	1	Biased	0.724	0.0181	-0.000659
PE2-RSYD11-DC-B-S002	2	Biased	1.42	0.0505	N/A
PE2-RSYD11-DC-B-S003	3	Biased	1.30	0.0403	N/A
PE2-RSYD11-DC-B-S004	4	Biased	0.778	-0.0952	N/A
PE2-RSYD11-DC-B-S005	5	Biased	0.658	0.000	N/A
PE2-RSYD11-DC-B-S006	6	Biased	0.821	0.0281	N/A
PE2-RSYD11-DC-B-S007	7	Biased	1.33	-0.0809	N/A

²²⁶Ra Radium-226¹³⁷Cs Cesium-137

Sr Strontium

pCi/g Picocuries per gram

Instrument and Survey Data										
Activity	Survey #	Date	Meter	Calibration Due Date	Serial #	Reference Area Static Bkgd	Reference Area Static 3σ IL	Reference Area Scan Bkgd	Reference Area Scan 3σ IL	Range
RSI Gamma Walkover Survey	HPRS-08312018-PE2-ROV2-2949	08/31/2018	RS-701/RSX-1	N/A	Console: 7236 Detectors: 5447,5448	N/A	N/A	3,400 CPS	4,842 CPS	2,697-5,171* CPS
RSI Follow-up Static Survey	HPRS-09192018-PE2-JSS2-2980	09/19/2018	RS-701/RSX-1	N/A	Console: 7236 Detectors: 5447,5448	3,612 CPS	4,255 CPS	N/A	N/A	3,366-5,018* CPS
Systematic Sample Survey	HPRS-09112018-PE2-JSS-2964	09/11/2018	2221	06/29/2019	117634	15,069 CPM	17,241 CPM	N/A	N/A	13,056-20,776* CPM
Biased Sample Survey	HPRS-09262018-PE2-JSS-2989	09/26/2018	2221	06/29/2019	117634	15,069 CPM	17,241 CPM	N/A	N/A	19,569-21,937* CPM

+ Gamma readings exceeding the Reference Area 3σ IL are attributable to the presence of naturally-occurring non-Navy program radionuclides in the excavated soil—see Note(s) in the Summary table (page 2) for more details.

3σ IL Investigation Level (established at 3σ above the mean of the Reference Area dataset)

CPS Counts per second

CPM Counts per minute

Summary
1) RSI gamma walkover survey and data review—upon review of initial scan data, follow-up static investigations were deemed necessary, and investigation locations were identified as per the RSI Data Evaluation Process (pages 3-4). Gamma scan coverage is shown on the Systematic Sample Survey map (page 8). Contour maps of scan data are shown on RSI Data Plots (page 5). Data review results are summarized on RSI Review Summary (page 6).
2) RSI Follow-up static survey—35 locations identified during the data review process were investigated. 25 follow-up locations exceeded the Reference Area static IL for regions of interests (ROIs) 6, 7, and/or 8 (VD1). Follow-up locations are shown on the RSI Follow-up Static Survey map (page 7). Note: Gamma readings reported in the Instrument and Survey Data table (page 1) for the gamma walkover and follow-up static surveys show the mean gamma gross count rate range (ROI 10, VD1) for all surveyed follow-up locations. Spectral analysis results show 25 follow-up locations exceeded the Reference Area Static IL for regions of interests (ROI) 6, 7, and/or 8. Biased samples were collected at seven representative locations to support the evaluation of the elevated gamma readings. Biased soil samples PE2-RSYD11-DC-B-S001-PE2-RSYD11-DC-B-S007 were collected and submitted for gamma spectroscopy analysis to further characterize the elevated soil readings at follow-up locations 12, 13, 15, 22, 24, 34, and 35 (see Summary Note 4 below).
3) Eighteen systematic soil samples (001-018) were obtained and submitted for gamma spectroscopy analysis. Sample locations for systematic samples are shown on the Systematic Sample Survey map (page 8). TestAmerica sample results are attached (pages 47-71). Ten percent of the systematic and biased soil samples (three samples in total, PE2-RSYD11-DC-S001, PE2-RSYD11-DC-S011 & PE2-RSYD11-DC-B-S001) were also analyzed for total strontium. Total Strontium results are also included in the TestAmerica sample results report (pages 47-71 & 72-88).
4) Biased sample survey—samples PE2-RSYD11-DC-B-S001-PE2-RSYD11-DC-B-S007 were obtained and analyzed to support the evaluation of elevated gamma readings collected at follow-up locations 12, 13, 15, 22, 24, 34, and 35. Biased soil sample location are shown on the Biased Sample Survey map (page 9). TestAmerica sample results are attached (pages 72-88). Note: Static gamma measurements collected at systematic and biased sample locations were obtained with a handheld Ludlum 2221 Scaler/Ratemeter and 3"x3" NaI probe; the results show gamma readings exceeding the instrument-specific Reference Area Static IL at several sample locations. Sample results indicate that this activity is due to the presence of naturally-occurring non-Navy program radionuclides in the excavated soil.
Conclusions: All locations with elevated Z-scores identified by the RSI gamma walkover survey were determined to be consistent with background. 35 locations were investigated during the follow-up static survey, with 25 readings greater than the Reference Area static IL. Biased soil samples were collected at seven representative follow-up locations to support the evaluation of elevated gamma readings. Spectral analysis results and gamma static data for each region of interest (ROI) are provided (pages 10-44). Final analytical results for systematic and biased samples from this RSY pad are concluded to be comparable to background. Histograms showing systematic soil sample activity concentrations are provided (pages 45-46). Ten percent of the systematic and biased soil samples (three samples in total, PE2-RSYD11-DC-S001, PE2-RSYD11-DC-S011 & PE2-RSYD11-DC-B-S001) were also analyzed for total strontium, with concentrations less than the Project Action Limit of 0.331 pCi/g, as shown in the Soil Sample Data table (page 1). This data package characterizes the construction base layer for RSY D11 pad. The soil was initially import clean material. APTIM request RASO concurrence to release this soil as Non-LLRW. Disposition: This soil shall be dispositioned as non-LLRW waste. The soil will be stockpiled onsite for reuse following appropriate chemical characterization.

RSI Data Evaluation Process

RS-700 Mobile Radiation Monitoring System

- Self-contained gamma-ray radiation detection and monitoring system
- (2) RSX-1 4-liter NaI(Tl) gamma detectors oriented perpendicular to the direction of travel (VD1 denotes both detectors summed; VD3 refers to the left detector; and VD4 refers to the right detector)
- Multi-Channel Analyzer, allowing for monitoring of energy-specific regions of interest (ROIs)
- RadAssist survey software for control, monitoring, and recording

Ten ROIs have been established for radium and progeny, cesium, and cobalt, as well as other naturally-occurring or anthropogenic gamma-emitting radionuclides that may be of interest:

ROI	Description	Energy Range (keV)	Primary Peak (keV)
1	Total counts	411 – 2811	N/A
2	Potassium	1371 – 1569	1460
3	U/Ra-226	1659 – 1860	1764 (Bi-214)
4	Thorium	2409 – 2811	2614 (Tl-208)
5	Annihilation	456 – 570	511
6	Ra-226	546 – 666	609 (Bi-214)
7	Cs-137	600 - 720	662
8	Pb-214/Ra-226	327 – 399	351
9	Co-60	1085 - 1370	1173/1332
10	Gross Counts	24 – 2811	N/A

A tiered approach is used during data review to identify follow-up locations. Raw data are exported to a comma delimited format using RadAssist and imported into an Excel spreadsheet for review and analysis. The following review steps are completed to determine if additional follow-up measurements are necessary:

- **Playback Review:** The data file is replayed in RadAssist and reviewed for elevated count rates in ROIs 6, 7, 9, and 10 for virtual detector (VD) 1 (both detectors summed). The scan screen is also monitored for elevated count rates and alarms.
- **Count Rate Time Series Review:** The count rates for ROIs 6, 7, 9, and 10 for VDs 1, 3 (detector 1), and 4 (detector 2) are plotted in a time series and reviewed for additional peaks in count rate.
- **All ROIs:**
 - **Z-Scores:** The Z-Scores are calculated for each location in all ROIs for VDs 1, 3, and 4. Any location with four or more ROIs having a Z-Score greater than three ($Z>3$) is marked for follow-up.
 - **Local Z-Scores:** Local Z-Scores are calculated using a moving average for each data point in all ROIs for VDs 1, 3, and 4 to identify elevated count rates where the background is variable (e.g. multiple surface types). Any location (in a survey unit that meets this condition) with four or more ROIs having a local $Z>3$ is marked for follow-up.
 - **Semi-local Z-Scores:** Semi-local Z-Scores are calculated using the global average, but with a moving average for the standard deviation for VDs 1, 3, and 4. This is used for survey data that have a consistent background but an area or areas of highly elevated count rates, in order to identify smaller areas of elevated count rates that may not otherwise be identified by the initial Z-score review. Any location (in a survey unit that meets this condition) with four or more ROIs having a semi-local $Z>3$ is marked for follow-up.
- **ROIs 3, 6, 8, and 10 (radium-specific ROIs):**
 - Z-Scores: The Z-Scores are calculated for each location in the radium-specific ROIs for VDs 1, 3, and 4. Any location with three or more radium-specific ROIs having a $Z>3$ is marked for follow-up.
 - Local Z-Scores: Local Z-Scores are calculated using a moving average for each data point in the radium-specific ROIs for VDs 1, 3, and 4 to identify elevated count rates where the background is variable (e.g. multiple surface types). Any location (in a survey unit that meets this condition) with three or more radium-specific ROIs having a local $Z>3$ is marked for follow-up.
 - Semi-local Z-Scores: Semi-local Z-Scores are calculated using the global average, but with a moving average for the standard deviation for VDs 1, 3, and 4. This is used for survey data that have a consistent background but an area or areas of highly elevated count rates, in order to identify smaller areas of elevated count rates that may not otherwise

be identified by the initial Z-score review. Any location (in a survey unit that meets this condition) with three or more radium-specific ROIs having a semi-local $Z > 3$ is marked for follow-up.

- **ROI 7 (cesium-specific ROI):**
 - Z-Scores: Z-Scores are calculated for each location in ROI 7 for VDs 1, 3, and 4. Any location having a $Z > 3$ is marked for follow-up.
 - Local Z-Scores: Local Z-Scores are calculated using a moving average for each data point in ROI 7 for VDs 1, 3, and 4 to identify elevated count rates where the background is variable (e.g. multiple surface types). Any location (in a survey unit that meets this condition) having a local $Z > 3$ is marked for follow-up.
 - Semi-local Z-Scores: Semi-local Z-Scores are calculated using the global average, but with a moving average for the standard deviation in ROI 7 for VDs 1, 3, and 4. This is used for survey data that have a consistent background but an area or areas of highly elevated count rates, in order to identify smaller areas of elevated count rates that may not otherwise be identified by the initial Z-score review. Any location (in a survey unit that meets this condition) having a semi-local $Z > 3$ is marked for follow-up.
- **ROI 9 (cobalt-specific ROI):**
 - Z-Scores: Z-Scores are calculated for each location in ROI 9 for VDs 1, 3, and 4. Any location having a $Z > 3$ is marked for follow-up.
 - Local Z-Scores: Local Z-Scores are calculated using a moving average for each data point in ROI 9 for VDs 1, 3, and 4 to identify elevated count rates where the background is variable (e.g. multiple surface types). Any location (in a survey unit that meets this condition) having a local $Z > 3$ is marked for follow-up.
 - Semi-local Z-Scores: Semi-local Z-Scores are calculated using the global average, but with a moving average for the standard deviation in ROI 9 for VDs 1, 3, and 4. This is used for survey data that have a consistent background but an area or areas of highly elevated count rates, in order to identify smaller areas of elevated count rates that may not otherwise be identified by the initial Z-score review. Any location (in a survey unit that meets this condition) having a semi-local $Z > 3$ is marked for follow-up.
- **Z-Score Time Series Review:** The three types of Z-Scores for ROIs 6, 7, 9, and 10 for VDs 1, 3, and 4 are plotted in a time series and reviewed for additional peaks in Z-Scores.

Any location selected for follow-up or with a Z-Score > 3 in a radium-, cesium-, or cobalt-specific ROI will undergo spectral analysis to determine if it is statistically likely that there are ROC concentrations present at that location in quantities greater than background.

A background spectrum is subtracted from the local spectral data for a given location, and the resulting net spectrum is plotted. Critical levels, as defined in Section 6.7.1 of the Multi Agency Radiation Survey and Site Investigation Manual are calculated and plotted based on background levels. The critical level is the level, in counts, at which there is a statistical probability (with a predetermined confidence) of incorrectly identifying a measurement system background value as greater than background. Any response above this level is considered to be greater than background. The critical level is calculated for ROIs 6, 7, 8, and 9 according to the equation shown below:

Where:

$$L_C = 2.33\sqrt{B}$$

LC	=	critical level (counts)
B	=	average background in the ROI

When count rates in the net gamma spectrum at a given location do not exceed critical levels for any radium-, cesium-, or cobalt-specific energy ranges, it is unlikely that ROC concentrations exist at that location above background.

Any data point that is both above the critical level and within the energy range of a given ROI is considered above background for that radionuclide and will be flagged for further investigation in the field.

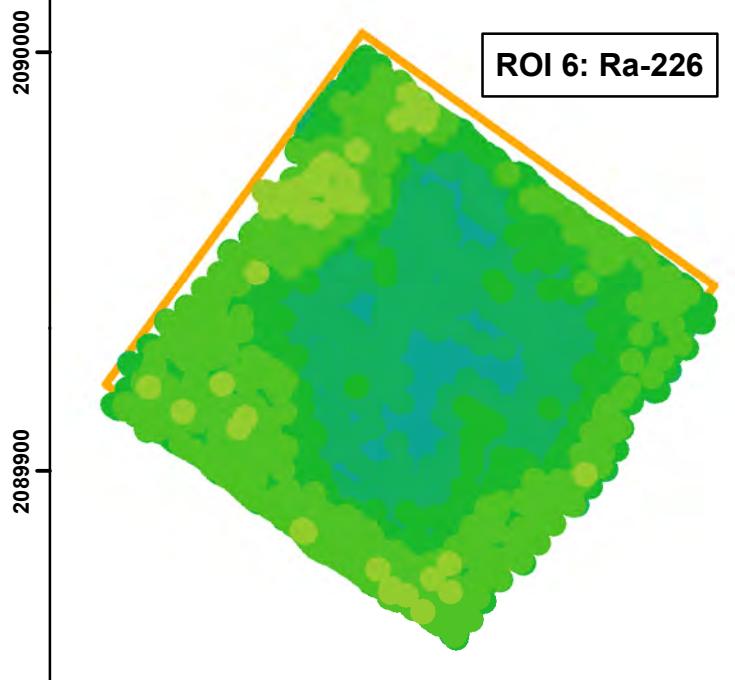
RSI Data Plots
HPNS Parcel E-2
RSY Pad D11 Deconstruction

Page 5 of 88

Contour Map
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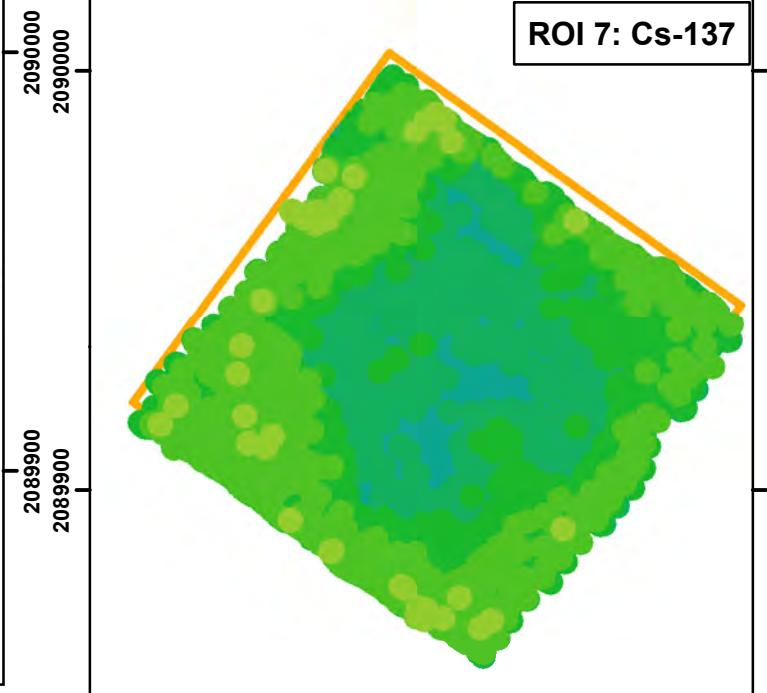
ROI 6: Ra-226



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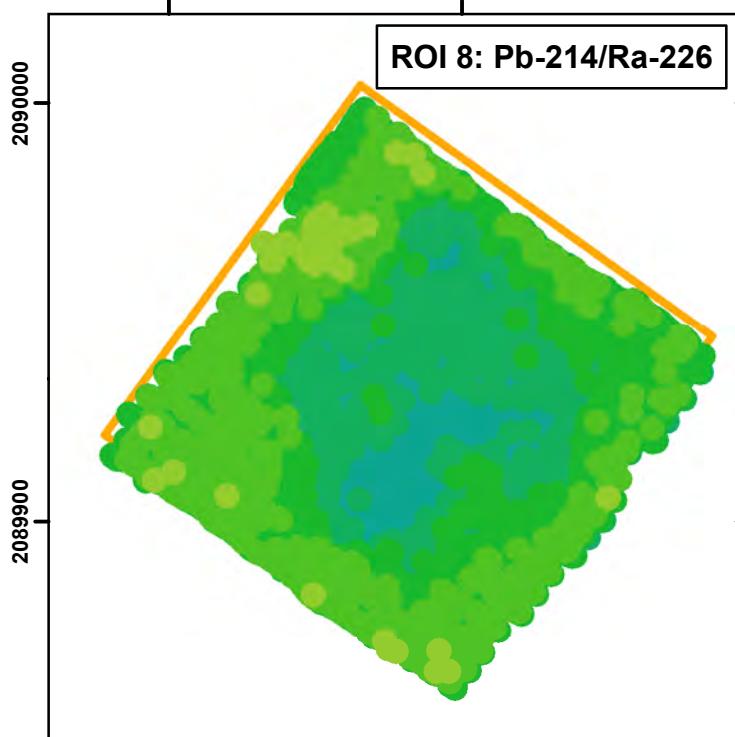
ROI 7: Cs-137



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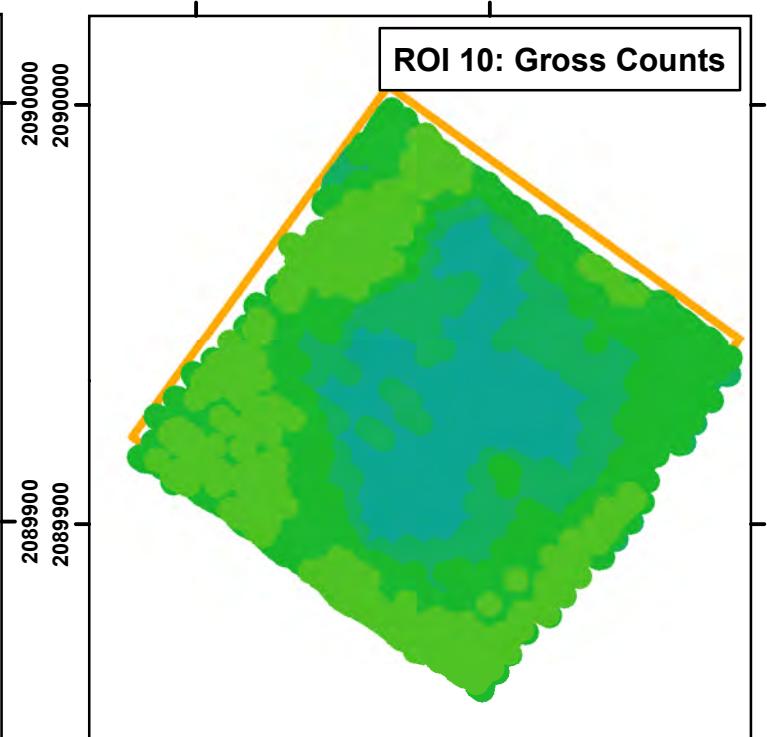
ROI 8: Pb-214/Ra-226



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ROI 10: Gross Counts



RS 700 Gamma Walkover Survey Data (VD1)

- > 3 std dev
 - > -1 to < 0 std dev
 - > 2 to < 3 std dev
 - > -2 to < -1 std dev
 - > 1 to < 2 std dev
 - > -3 to < -2 std dev
 - > 0 to < 1 std dev
 - < -3 std dev
- RSY Pad Boundaries

0 20 40 80 Feet

Coordinate system: CSP Zone III, NAD83, US Survey Foot



RSI Review Summary

Summary:

35 locations were initially selected for follow-up investigation. Locations were identified by elevated peaks noted in the playback review and/or time series charts, and by using the Z-Score, Local Z-Score, and Semi-Local Z-Score reviews as described in the RSI Data Evaluation Process on pages 3-4. Spectral analyses performed on 25 gamma static data locations exceeded the Reference Area Static IL for region of interest (ROIs) 6, 7, and/or 8. All other gamma static readings at follow-up locations were less than the Reference Area static IL for ROIs 3, 6, 7, and 8; figures for all locations are provided on pages 10-44.

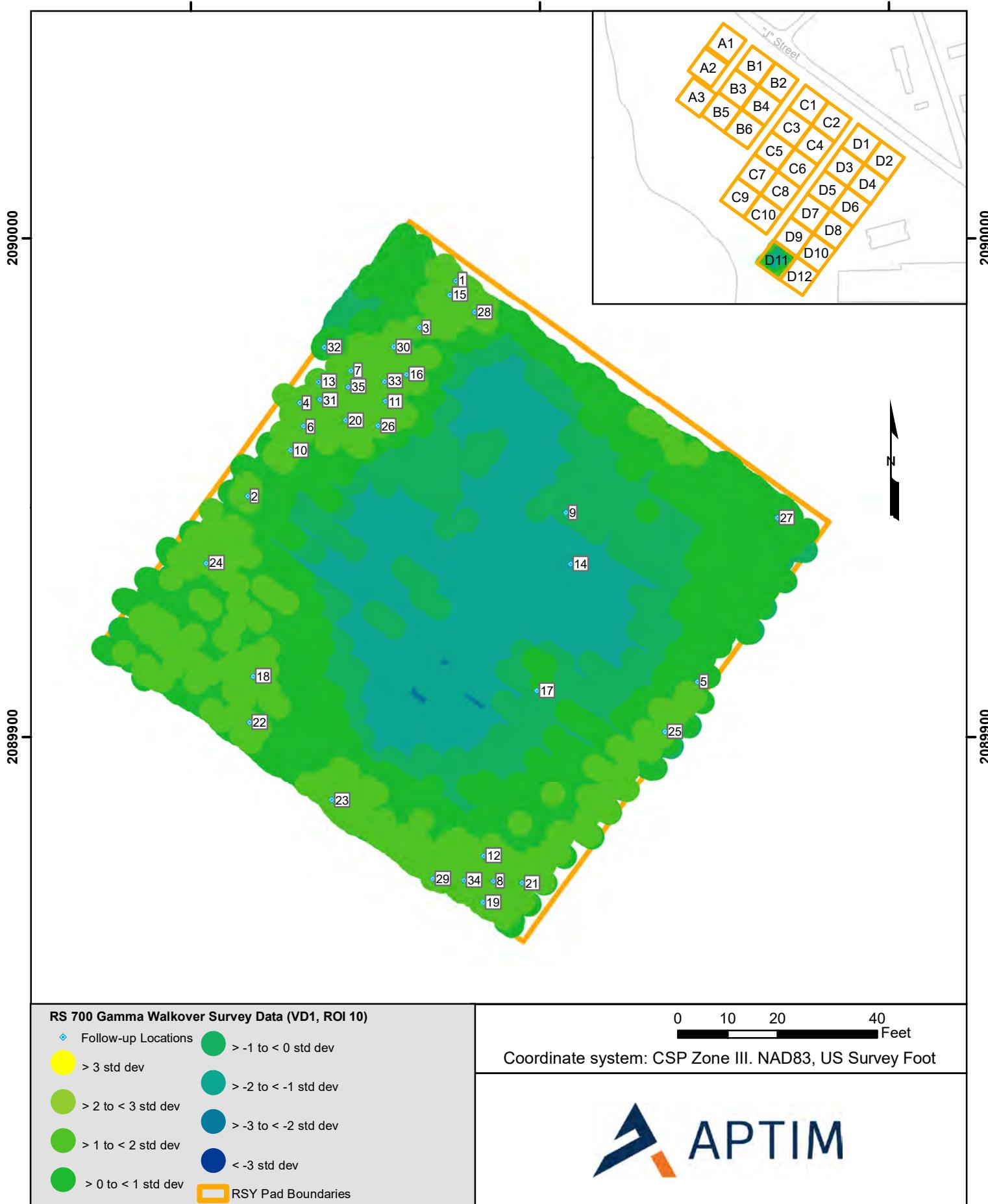
RSI Follow-up Static Survey
HPRS-09192018-PE2-JSS2-2980

HPNS Parcel E-2 RSY Pad D11 (DC)

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Systematic Sample Survey
HPRS-09112018-PE2-JSS-2964

HPNS Parcel E-2 RSY Pad D11-DC

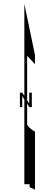
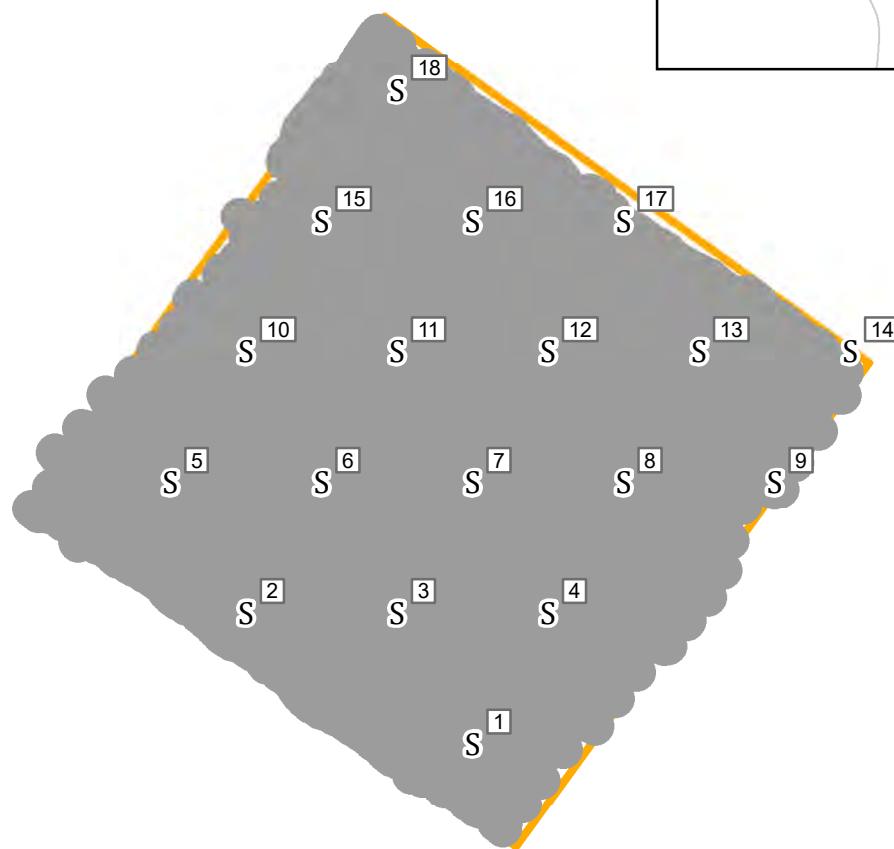
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Survey Instrument: Model 2221/ 44-20
Serial Number: 117634

S Systematic Sample Locations

RS-700 GWS Scan Coverage

RSY Pad Boundaries

0 15 30 60 Feet

Coordinate system: CSP Zone III, NAD83, US Survey Foot



Biased Sample Survey
HPRS-09262018-PE2-JSS-2989

**HPNS Parcel E-2
RSY Pad D11-DC**

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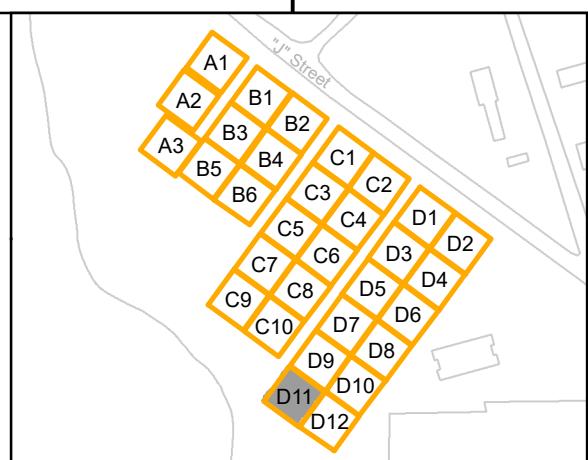
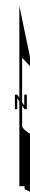
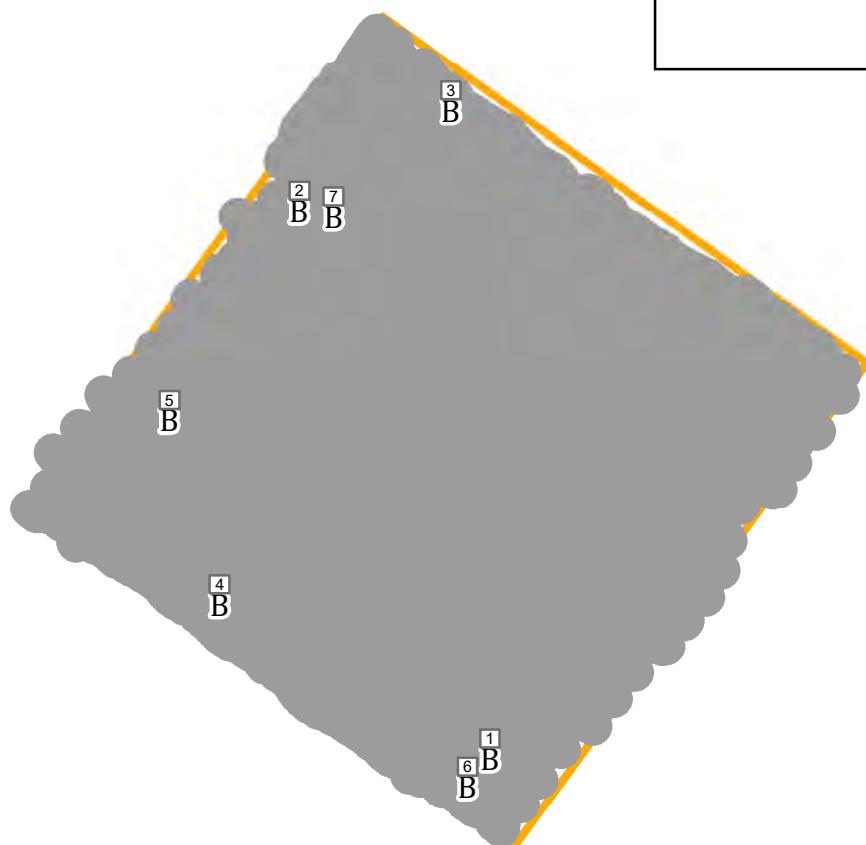
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**Survey Instrument: Model 2221/ 44-20
Serial Number: 117634**

B Biased Sample Locations

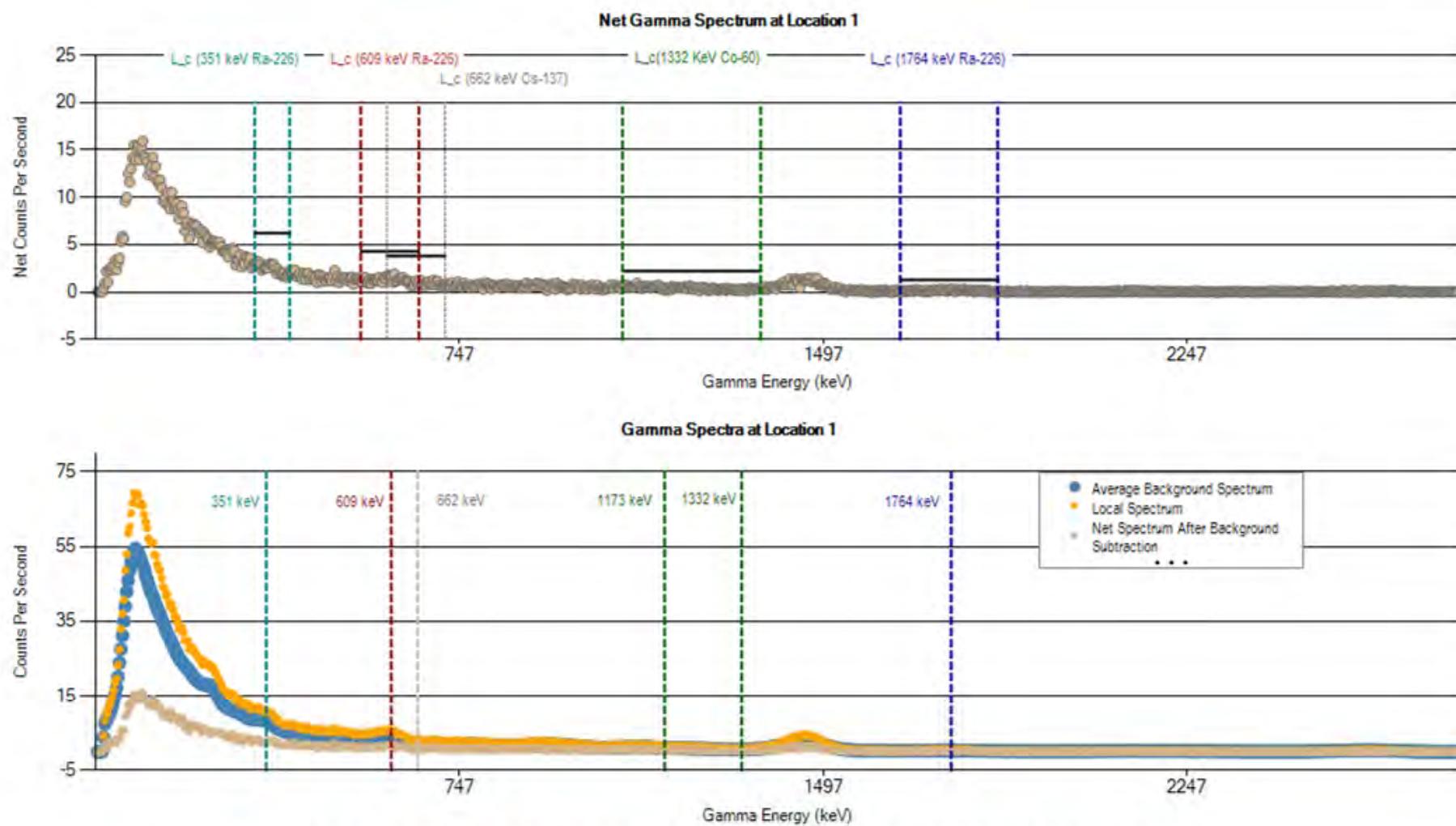
RS-700 GWS Scan Coverage

RSY Pad Boundaries

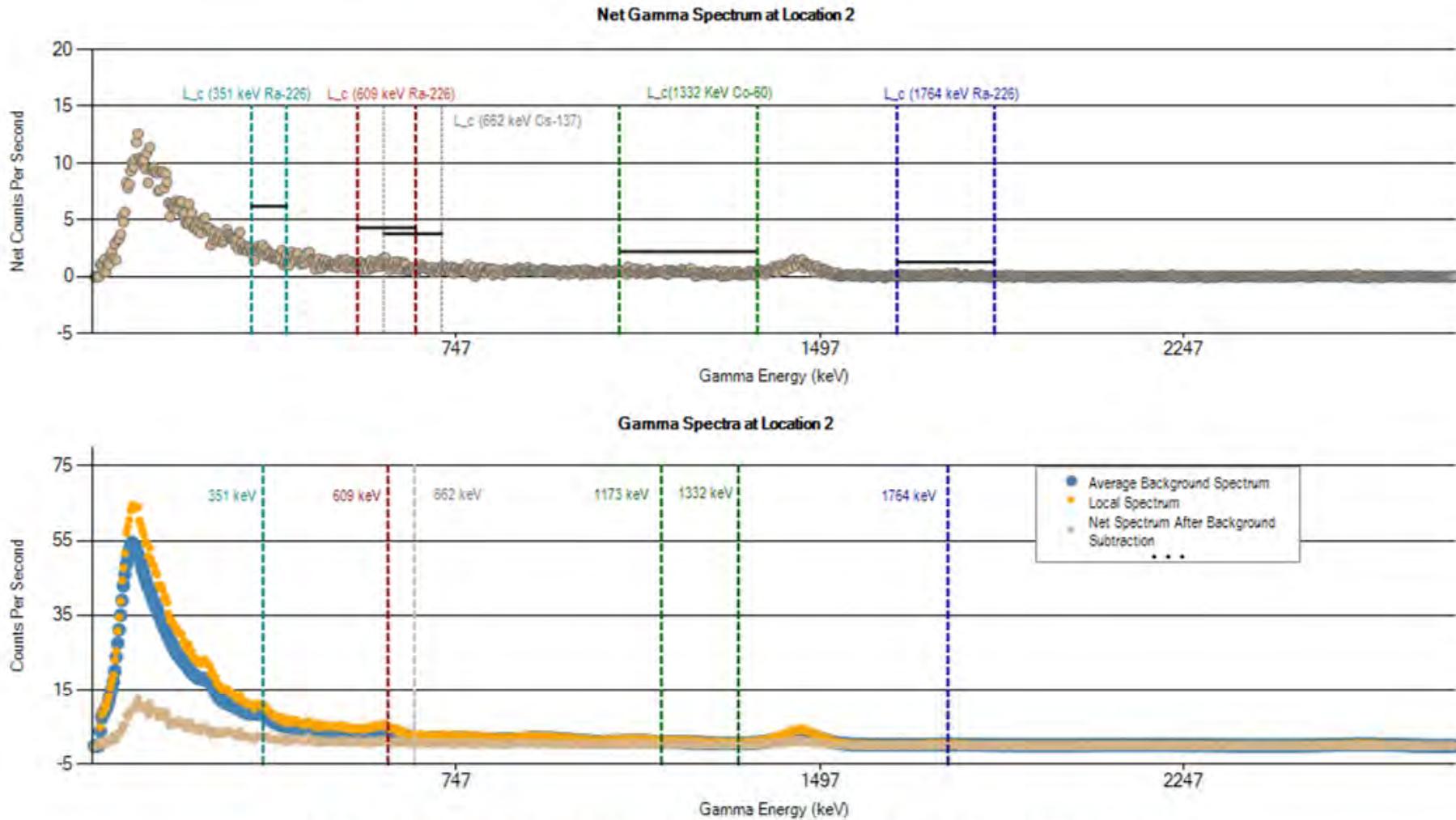
0 15 30 60 Feet

Coordinate system: CSP Zone III, NAD83, US Survey Foot

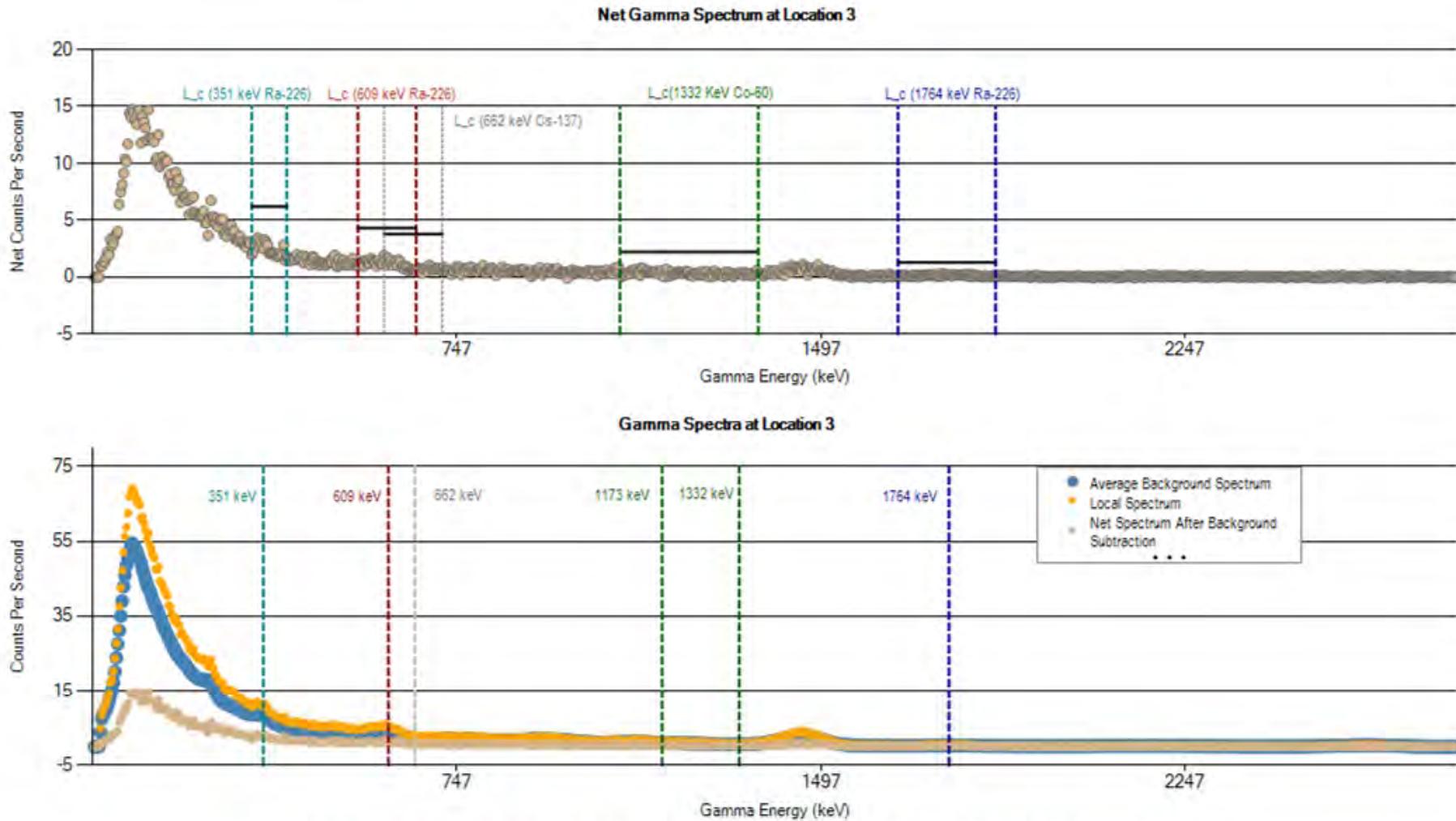




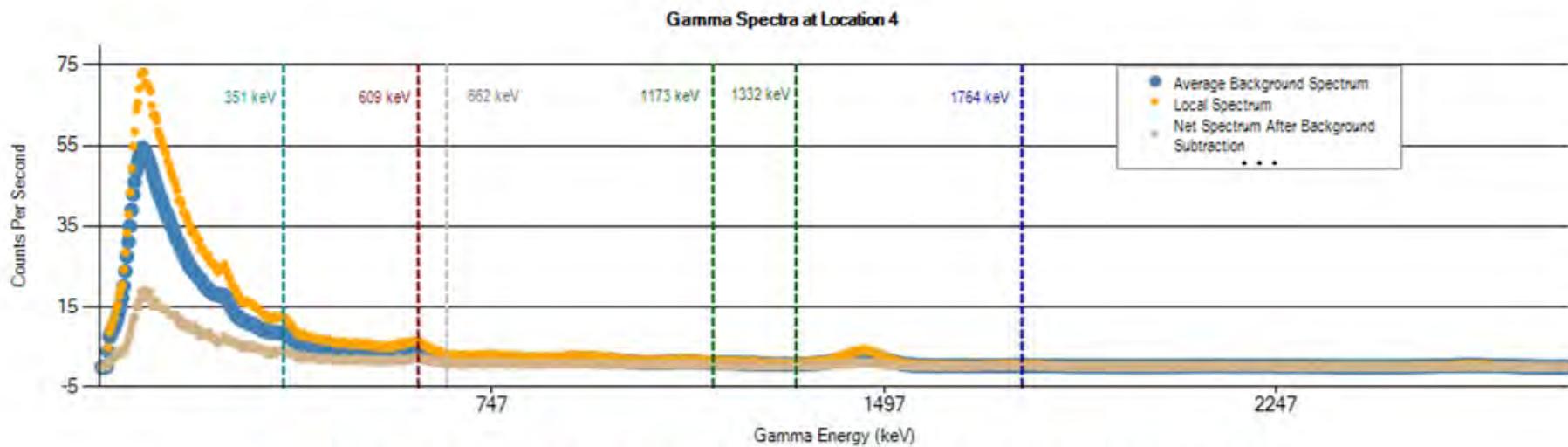
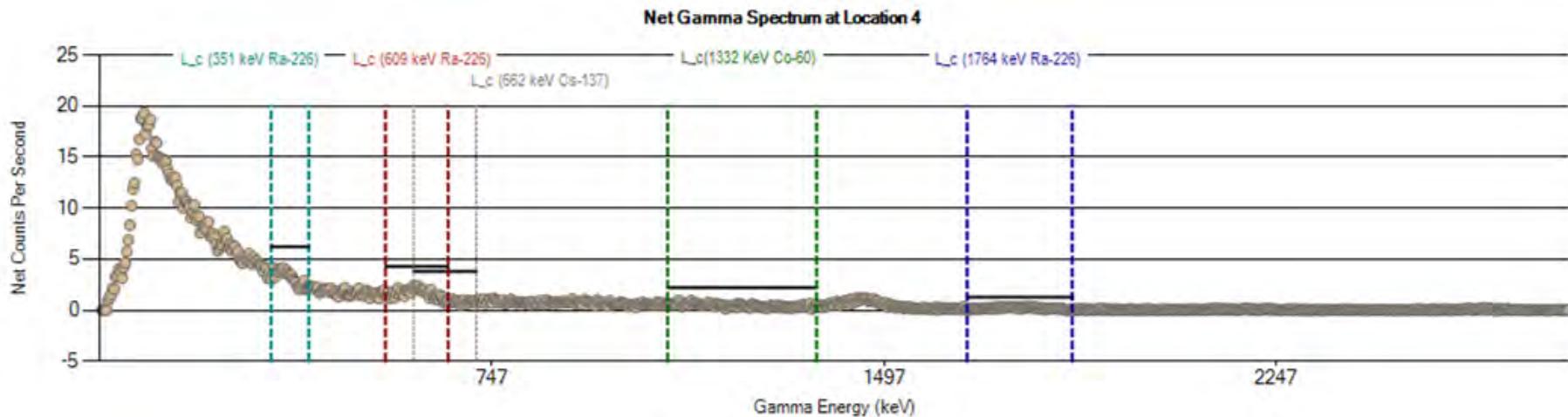
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Location 1 (cps)	1170	161	30	29	206	191	150	235	128	4754
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255



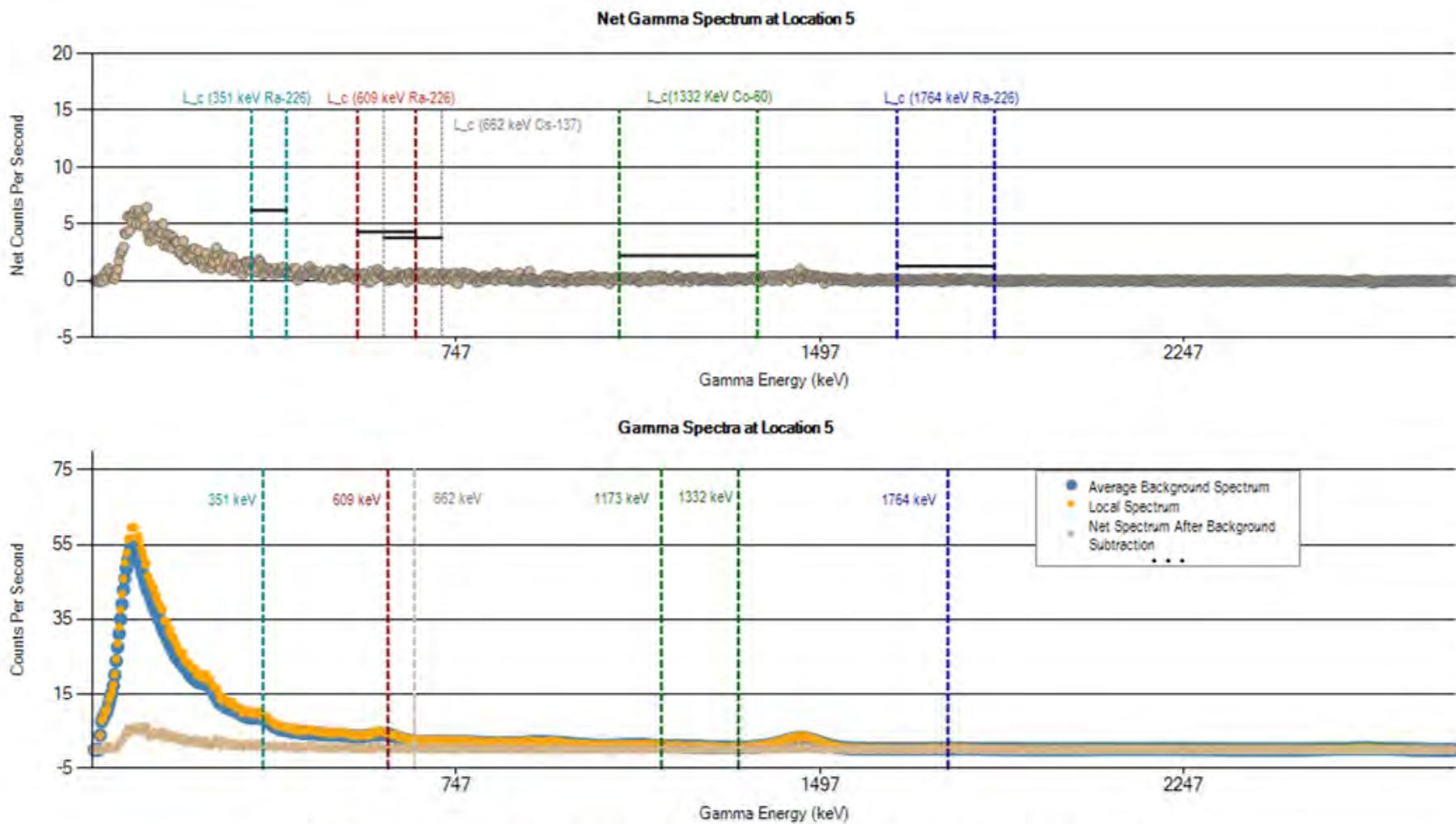
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Location 2 (cps)	1116	156	26	27	194	180	141	224	124	4487
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255



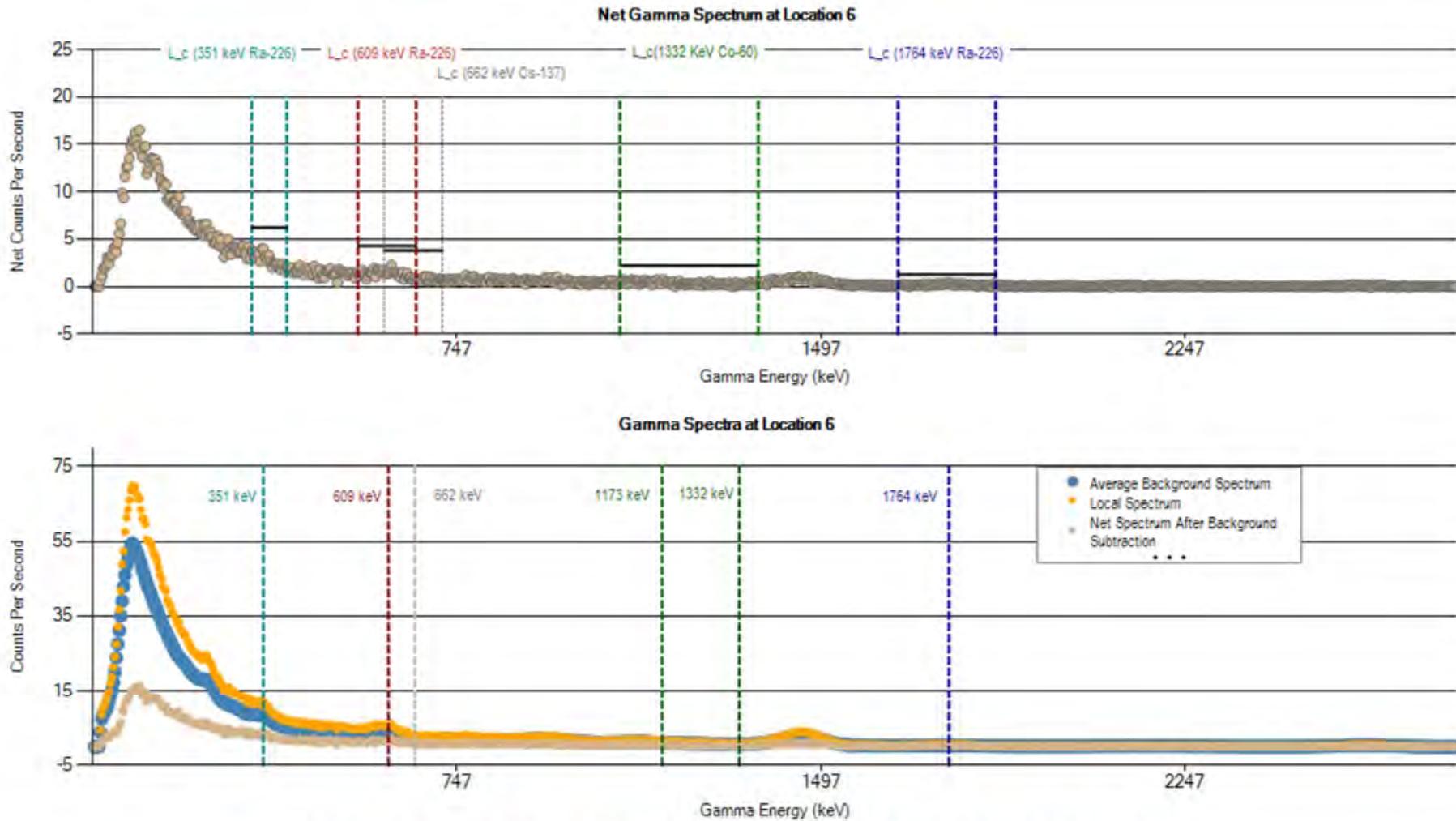
	ROI 1	ROI 2	ROI 3	ROI 4	ROI 5	ROI 6	ROI 7	ROI 8	ROI 9	ROI 10
Location 3 (cps)	1124	146	29	27	201	187	143	234	121	4679
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255



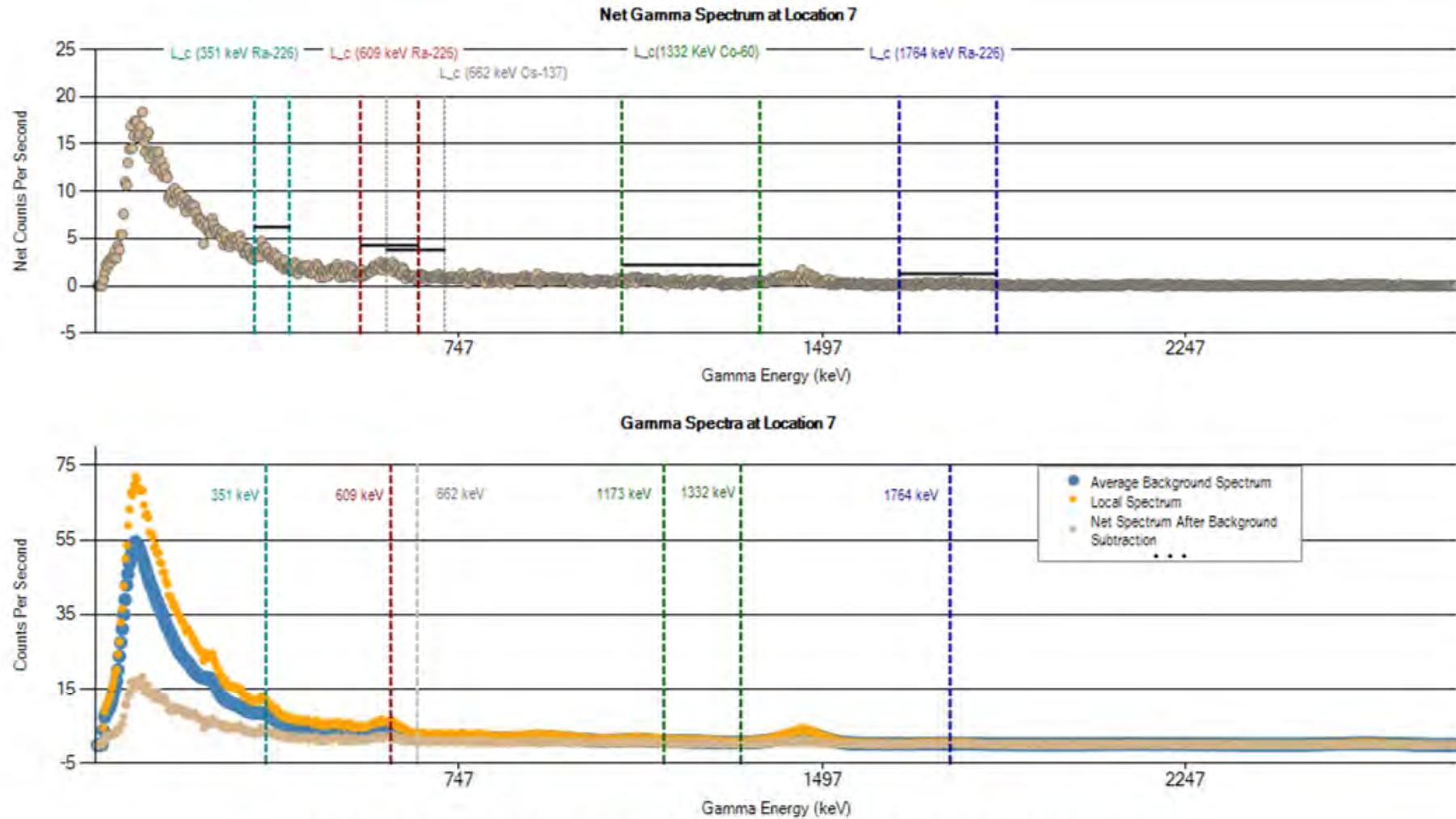
	ROI 1	ROI 2	ROI 3	ROI 4	ROI 5	ROI 6	ROI 7	ROI 8	ROI 9	ROI 10
Location 4 (cps)	1215	155	33	30	215	205	157	253	131	4971
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255



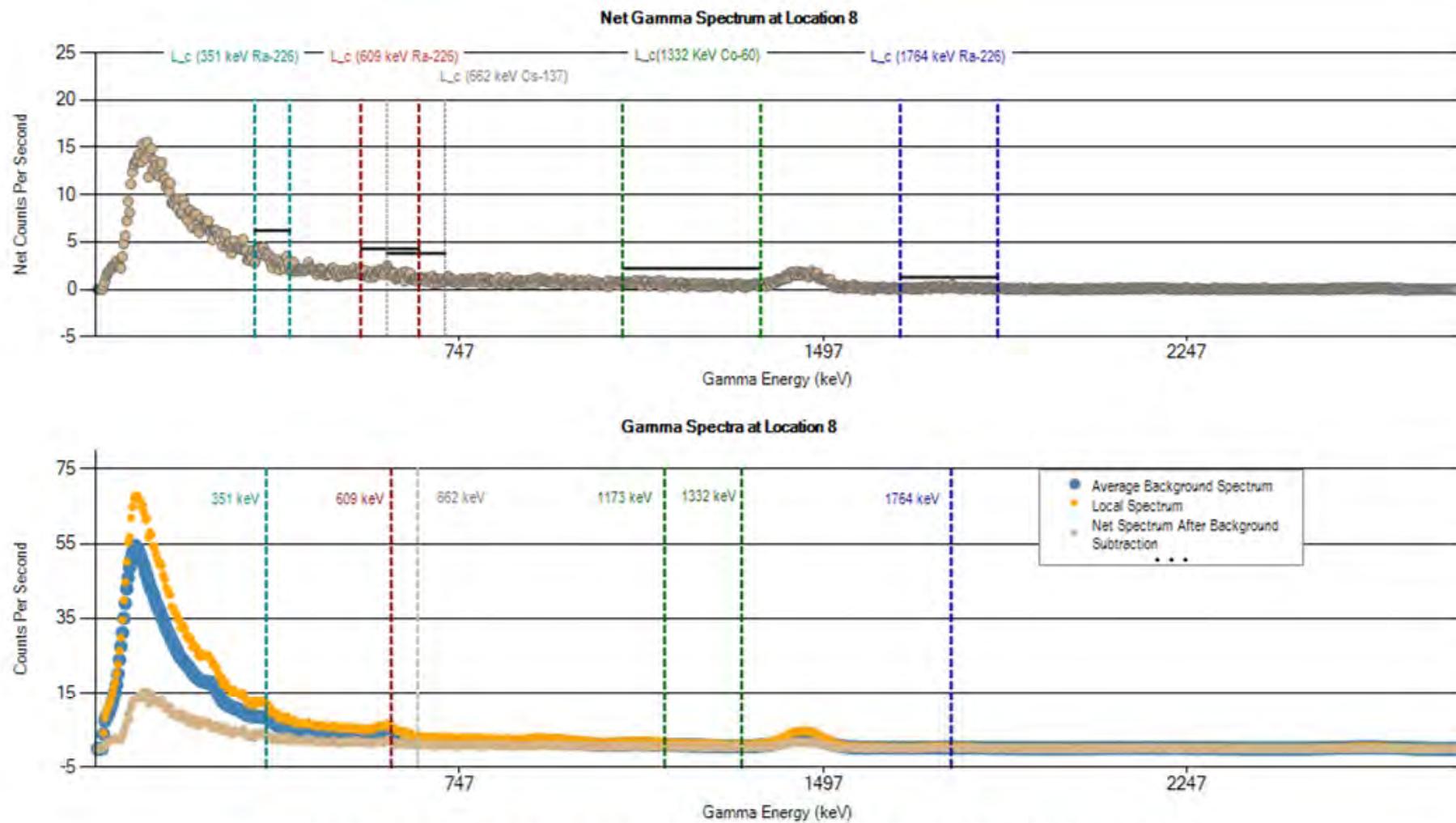
	ROI1	ROI2	ROI3	ROI4	ROI5	ROI6	ROI7	ROI8	ROI9	ROI10
Location 5 (cps)	972	132	25	23	170	157	123	199	104	4029
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255



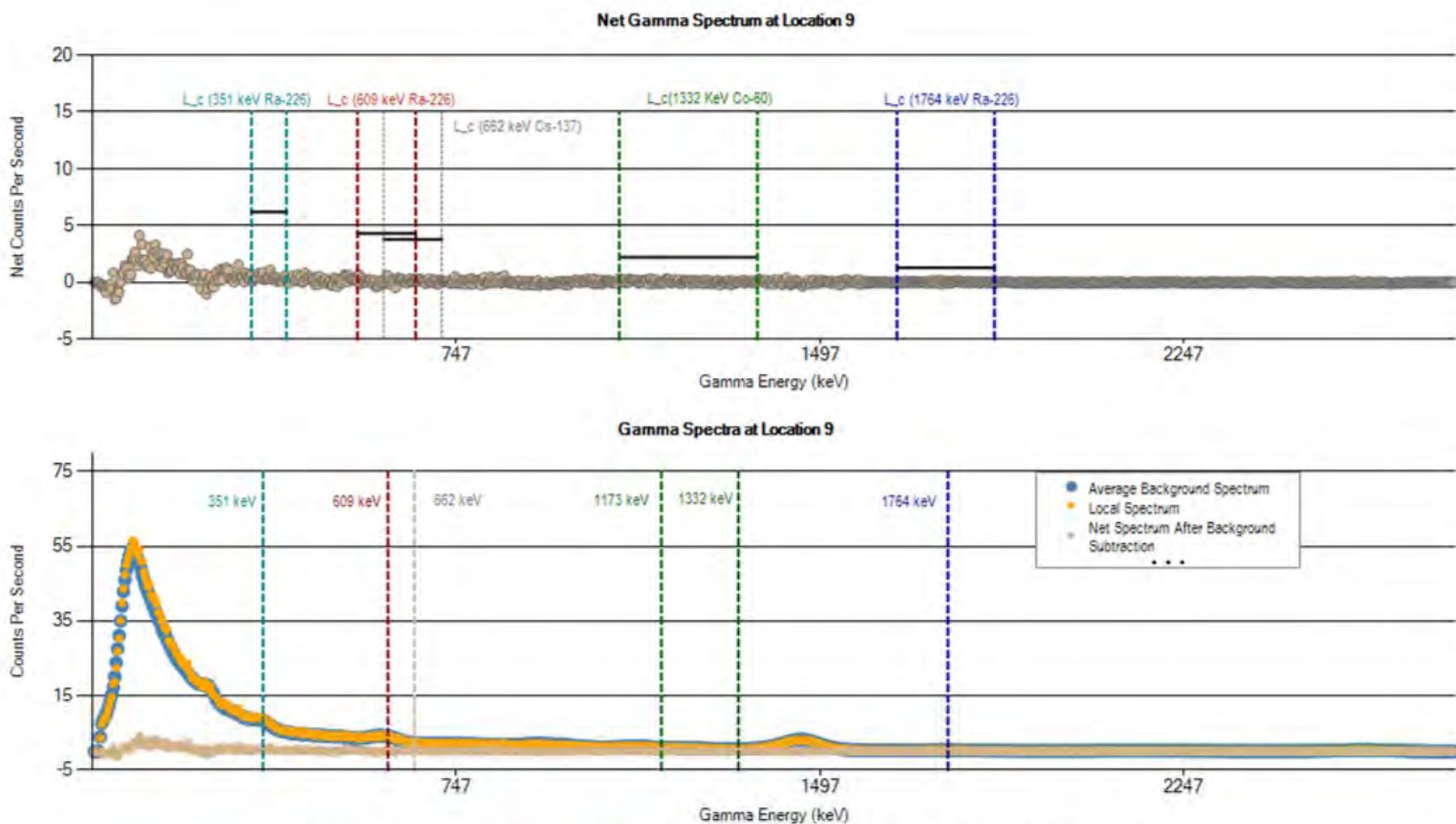
	ROI 1	ROI 2	ROI 3	ROI 4	ROI 5	ROI 6	ROI 7	ROI 8	ROI 9	ROI 10
Location 6 (cps)	1160	151	32	29	205	194	149	242	123	4779
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255



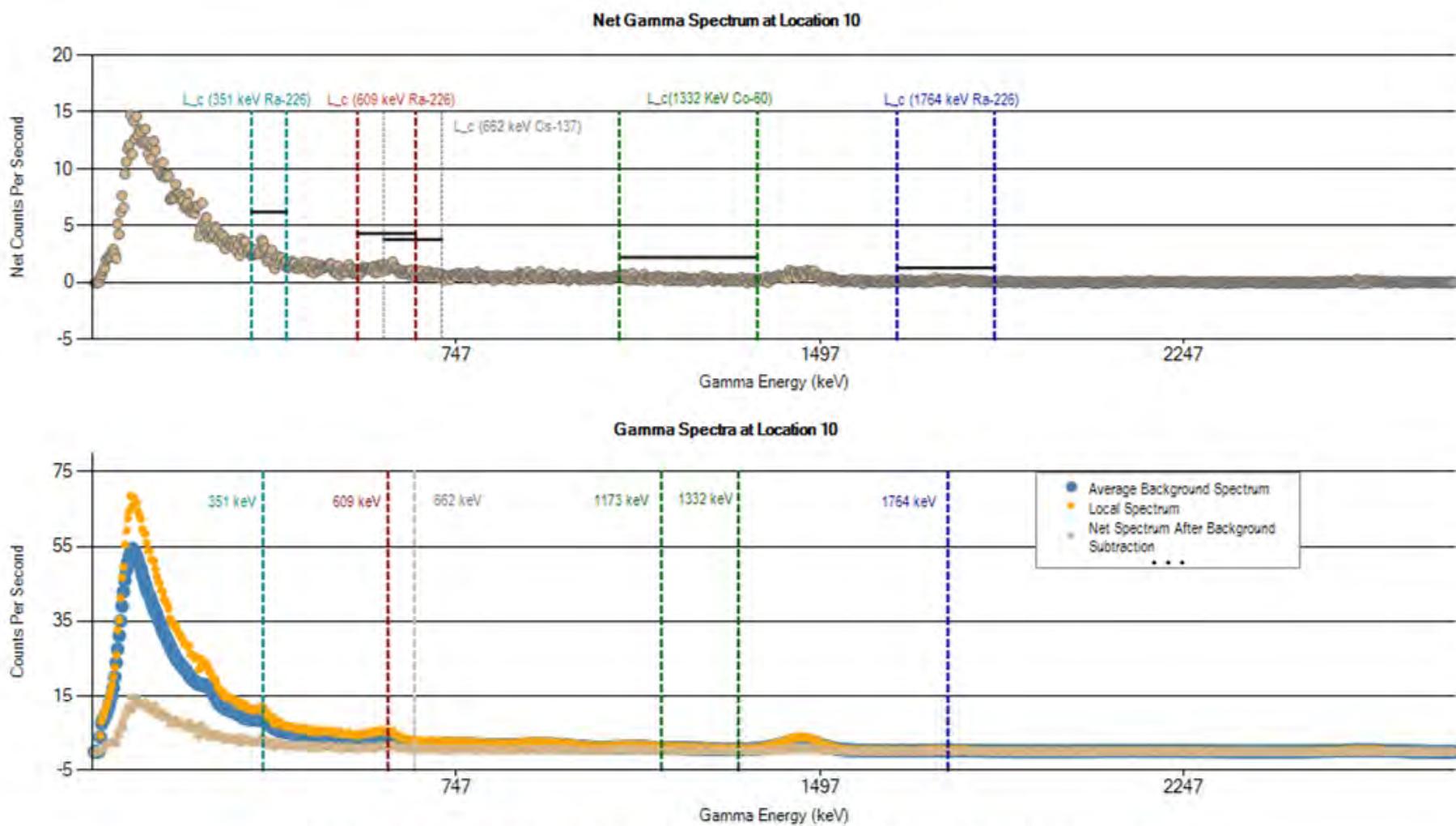
	ROI 1	ROI 2	ROI 3	ROI 4	ROI 5	ROI 6	ROI 7	ROI 8	ROI 9	ROI 10
Location 7 (cps)	1201	152	33	30	210	205	156	249	131	4894
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255



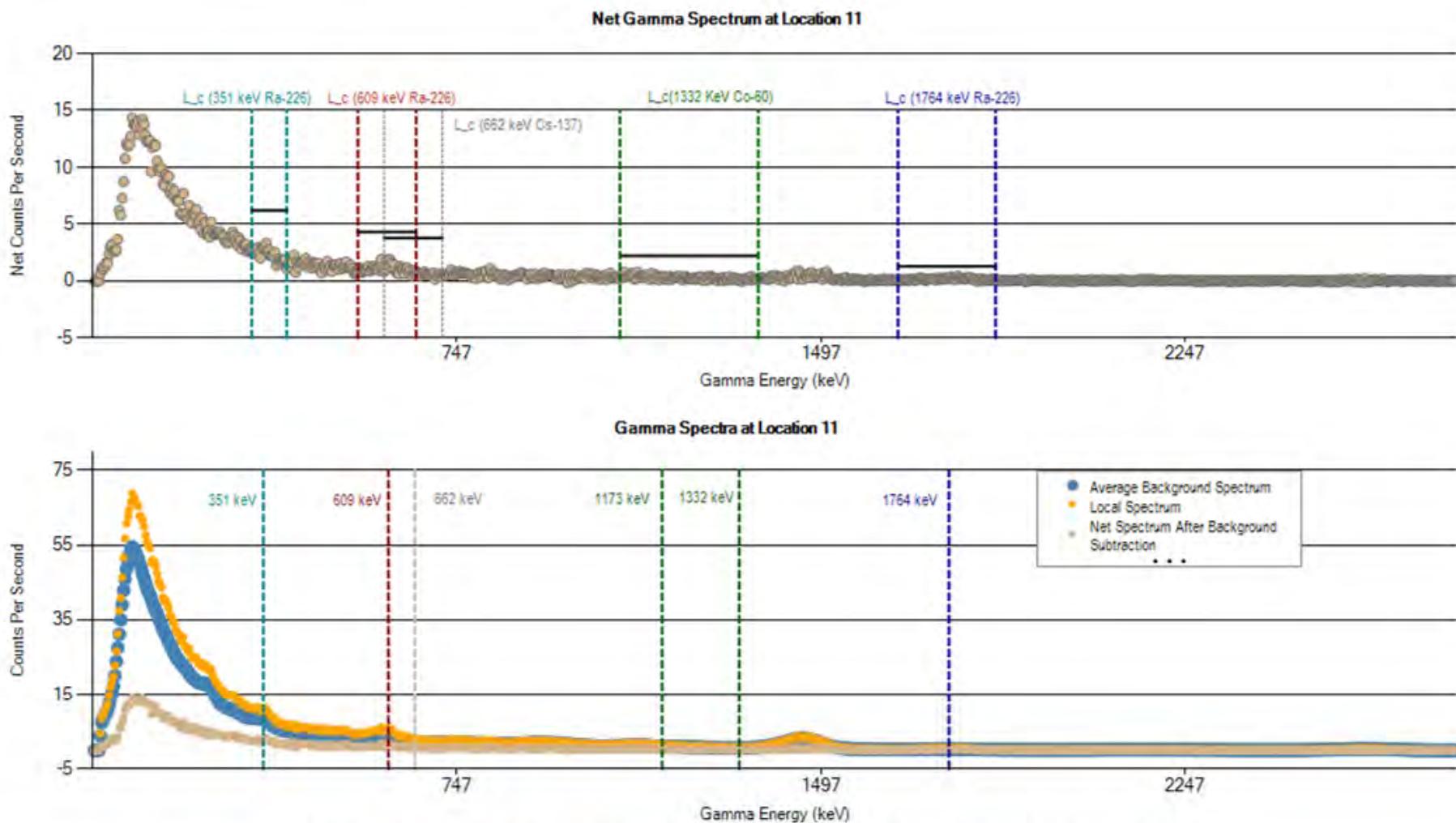
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Location 8 (cps)	1265	179	31	30	221	204	158	254	140	4892
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255



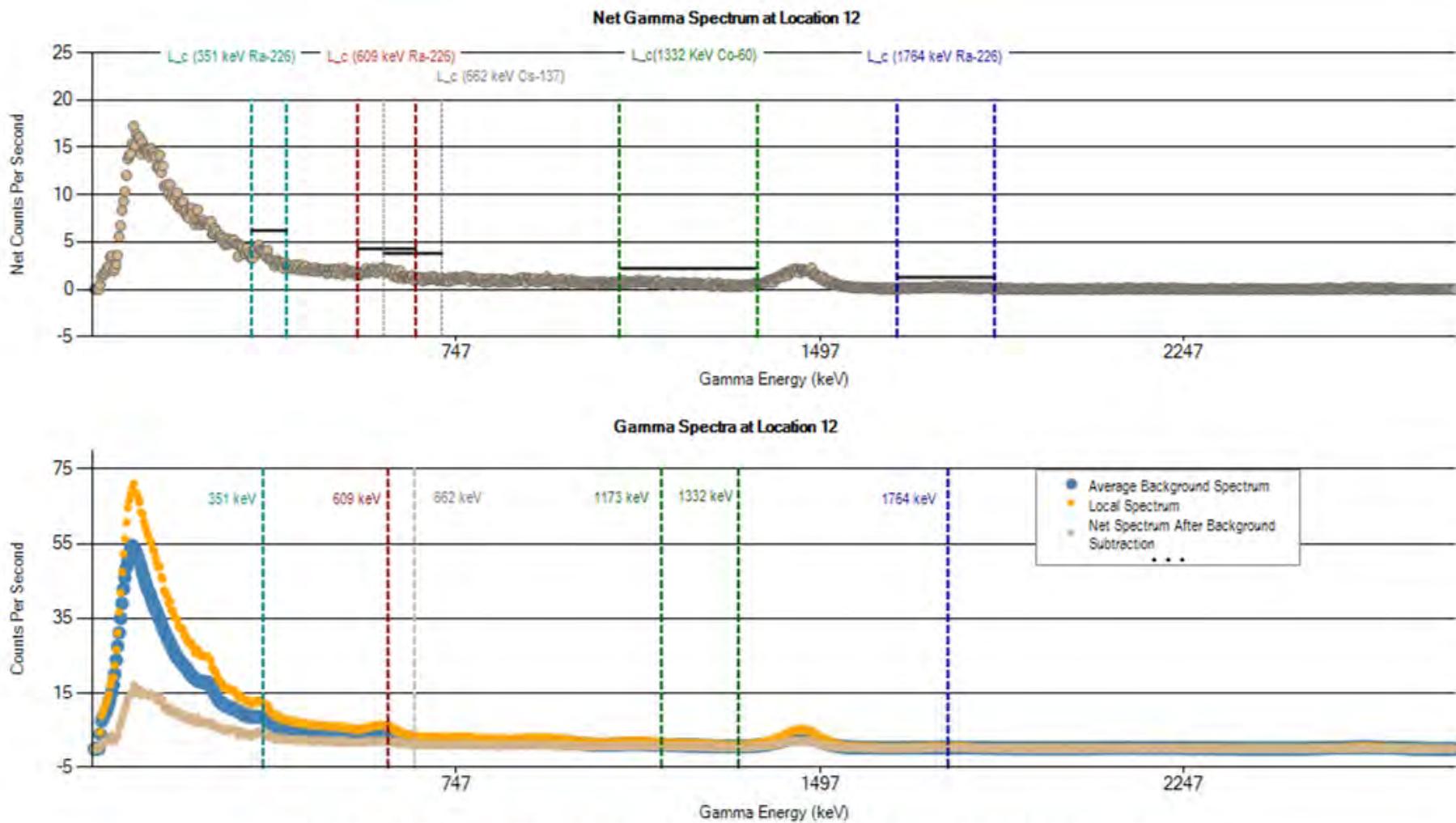
	ROI1	ROI2	ROI3	ROI4	ROI5	ROI6	ROI7	ROI8	ROI9	ROI10
Location 9 (cps)	882	117	22	21	158	145	113	184	95	3743
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255



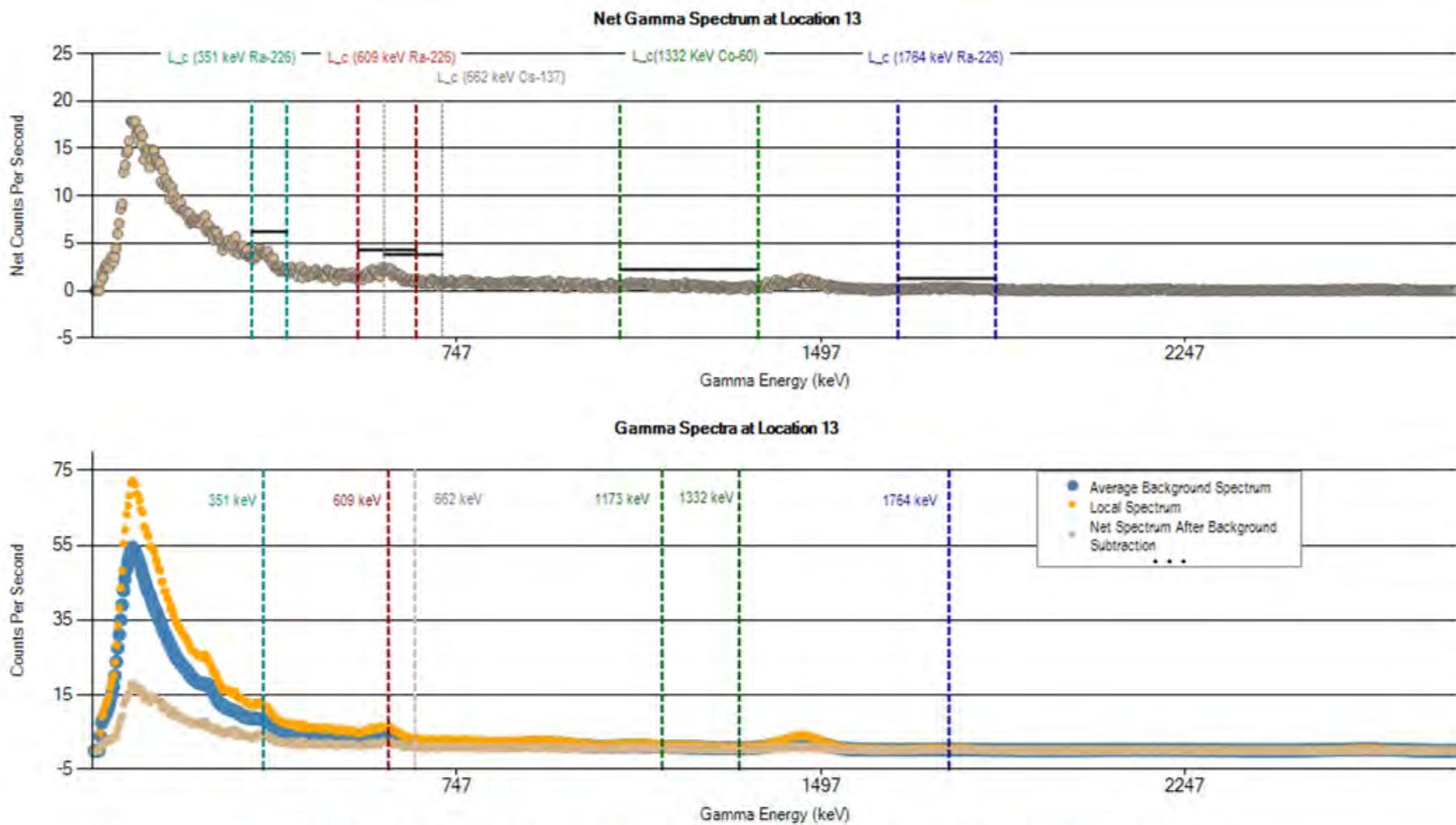
	ROI 1	ROI 2	ROI 3	ROI 4	ROI 5	ROI 6	ROI 7	ROI 8	ROI 9	ROI 10
Location 10 (cps)	1114	146	29	28	198	187	145	232	119	4630
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255



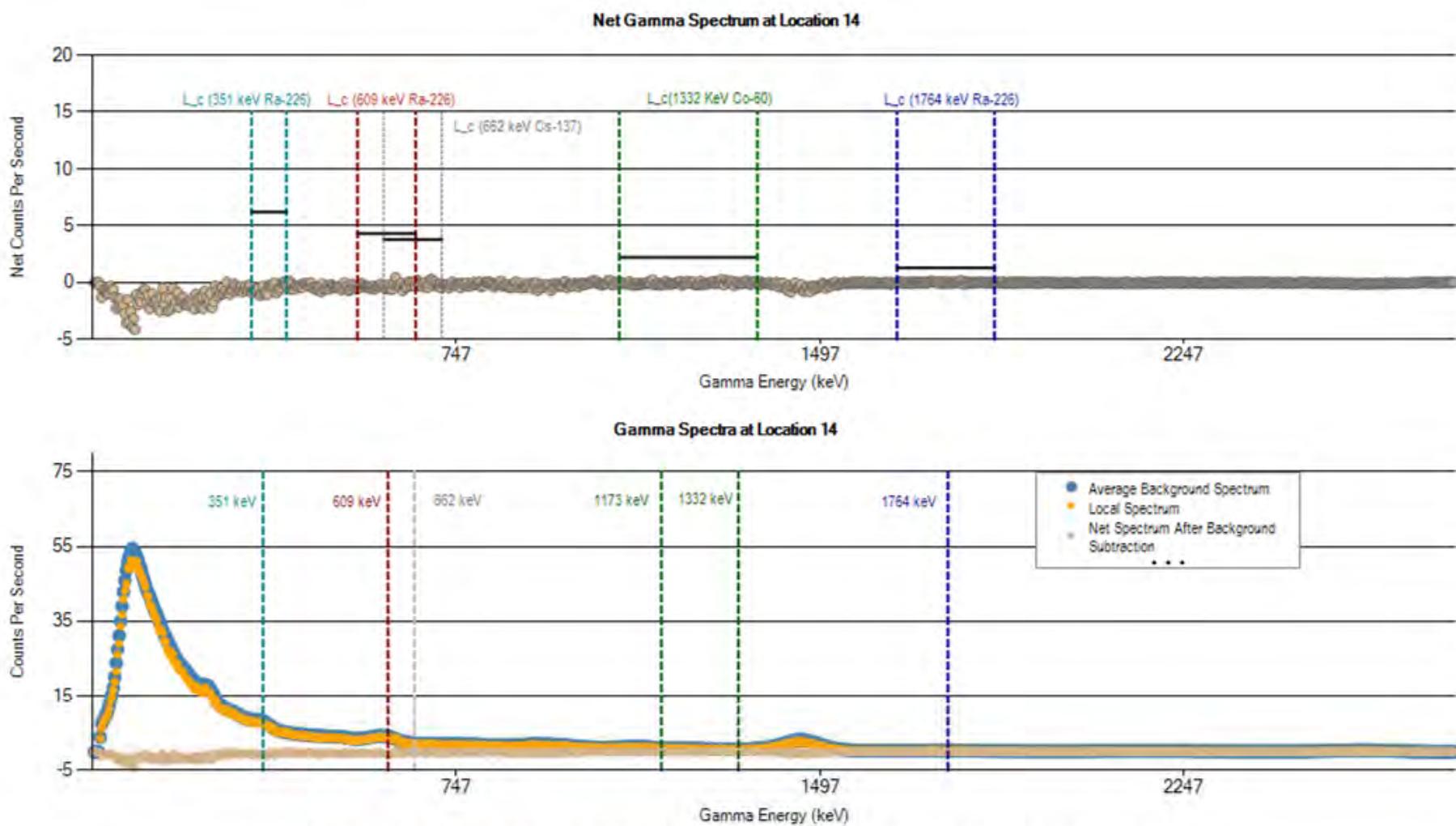
	ROI1	ROI2	ROI3	ROI4	ROI5	ROI6	ROI7	ROI8	ROI9	ROI10
Location 11 (cps)	1094	137	31	27	196	184	141	231	115	4601
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255



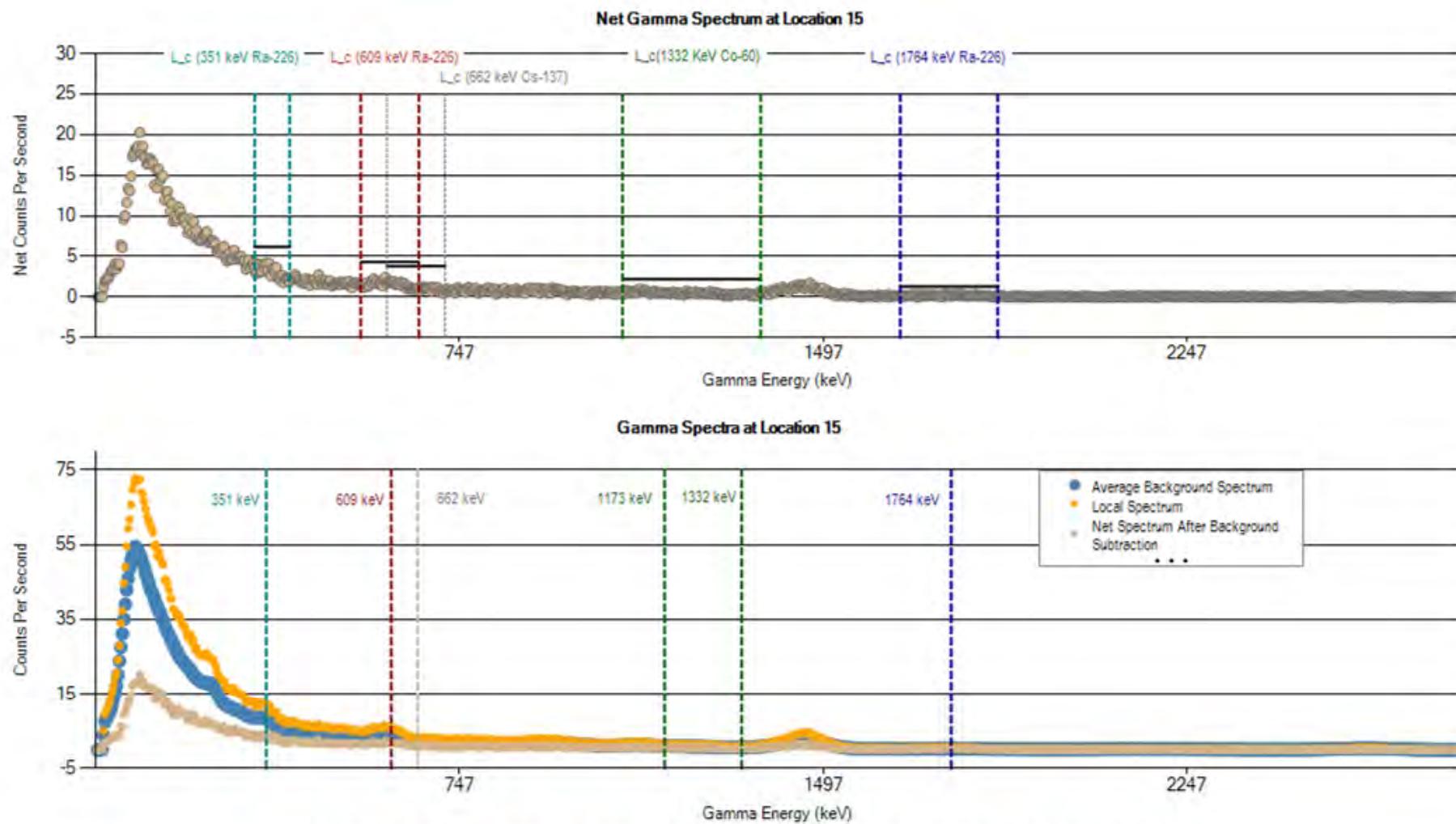
	ROI 1	ROI 2	ROI 3	ROI 4	ROI 5	ROI 6	ROI 7	ROI 8	ROI 9	ROI 10
Location 12 (cps)	1310	192	32	31	226	210	162	258	144	5018
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255



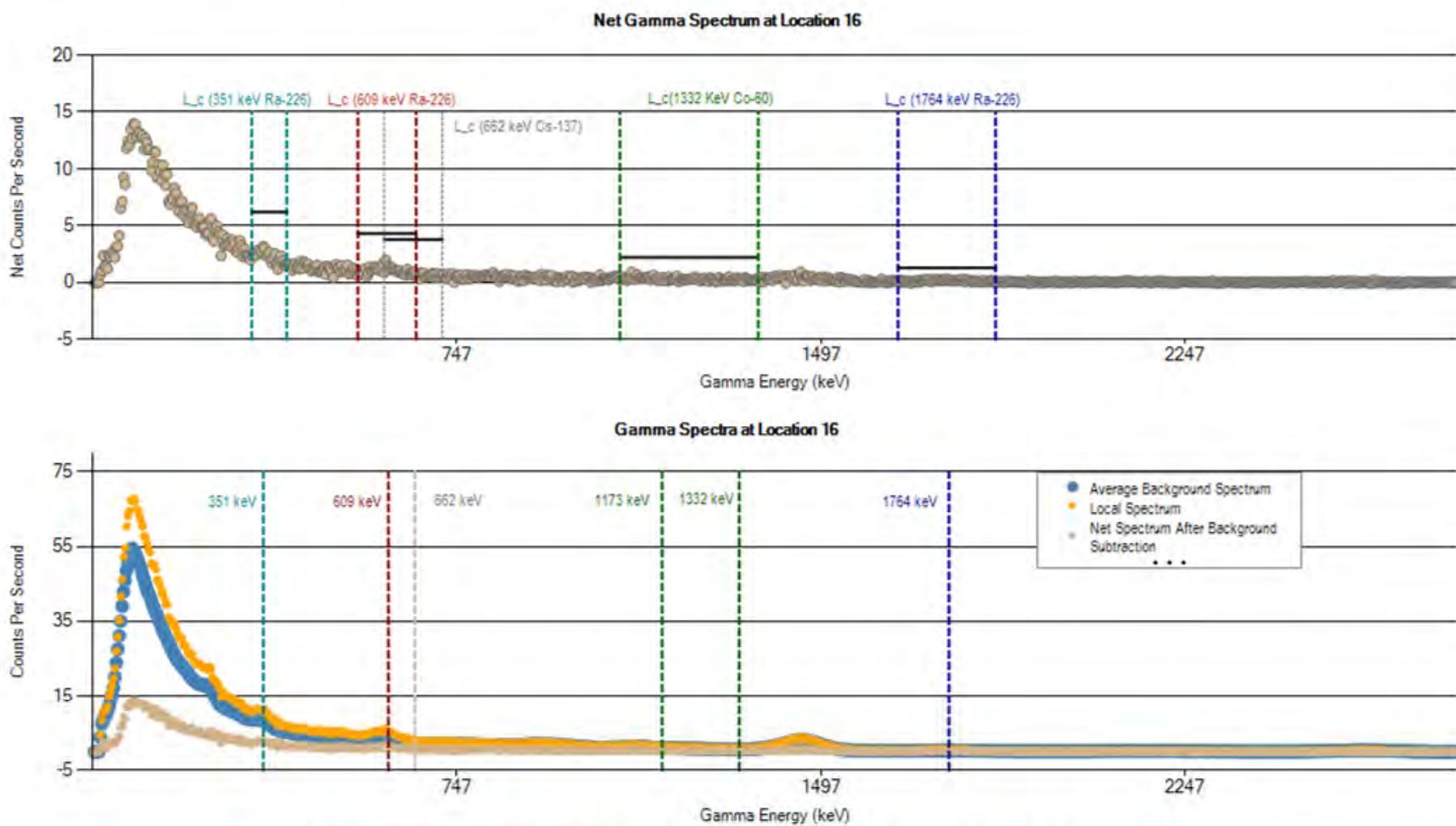
	ROI 1	ROI 2	ROI 3	ROI 4	ROI 5	ROI 6	ROI 7	ROI 8	ROI 9	ROI 10
Location 13 (cps)	1221	156	34	30	216	206	157	253	134	4951
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255



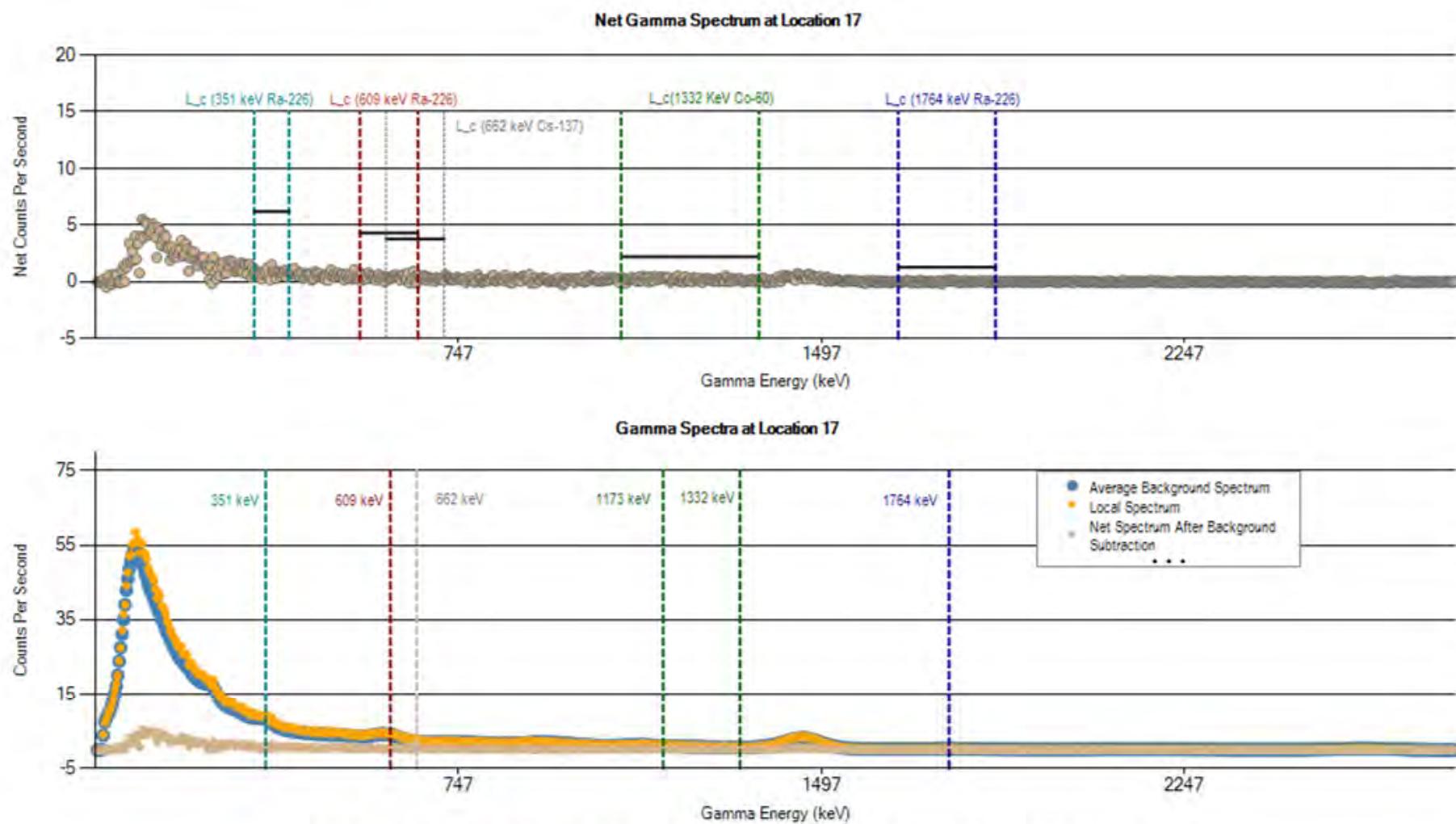
	ROI1	ROI2	ROI3	ROI4	ROI5	ROI6	ROI7	ROI8	ROI9	ROI10
Location 14 (cps)	769	98	21	19	135	128	99	161	83	3366
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255



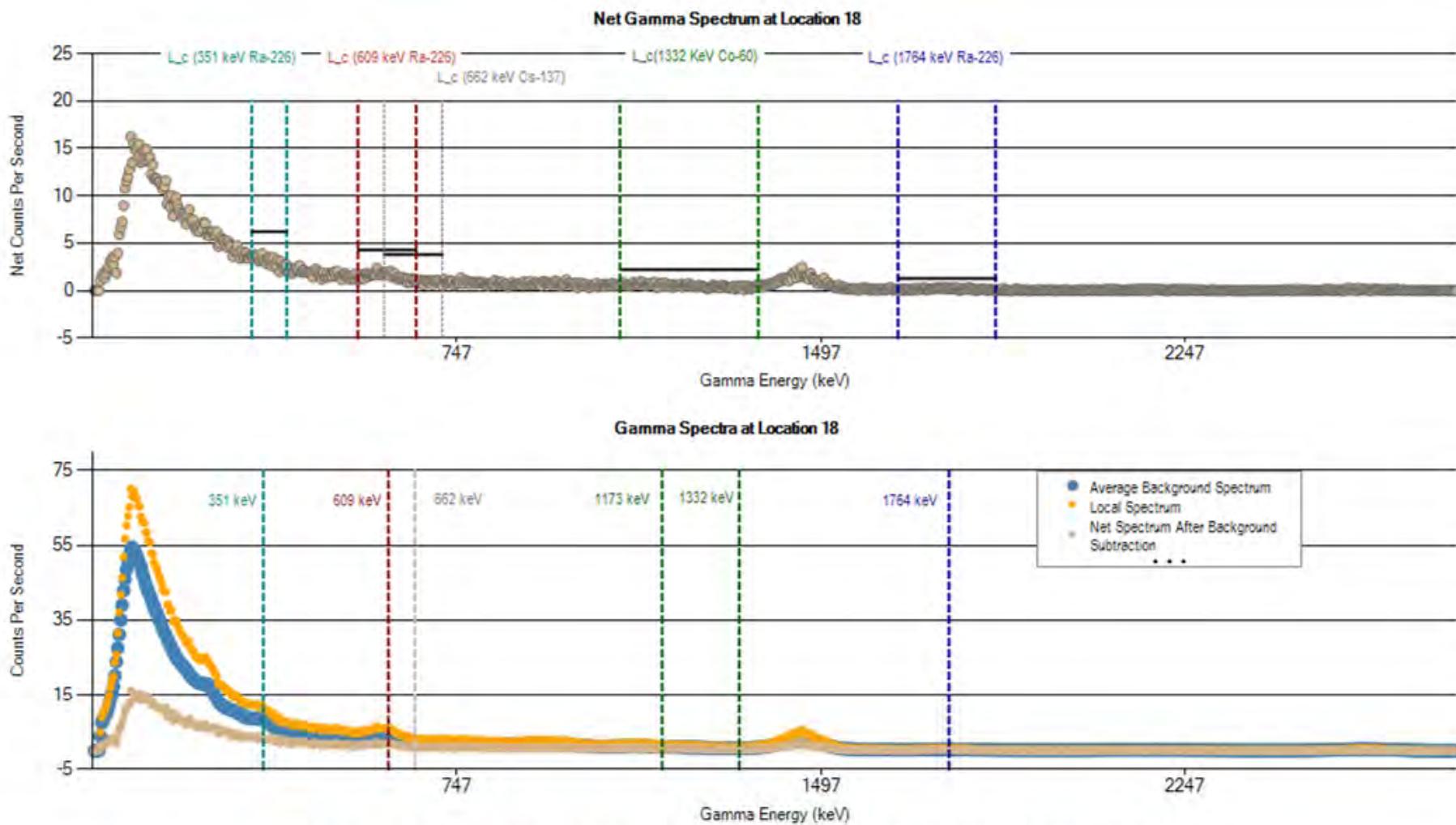
	ROI 1	ROI 2	ROI 3	ROI 4	ROI 5	ROI 6	ROI 7	ROI 8	ROI 9	ROI 10
Location 15 (cps)	1231	165	32	30	218	204	157	250	134	5004
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255



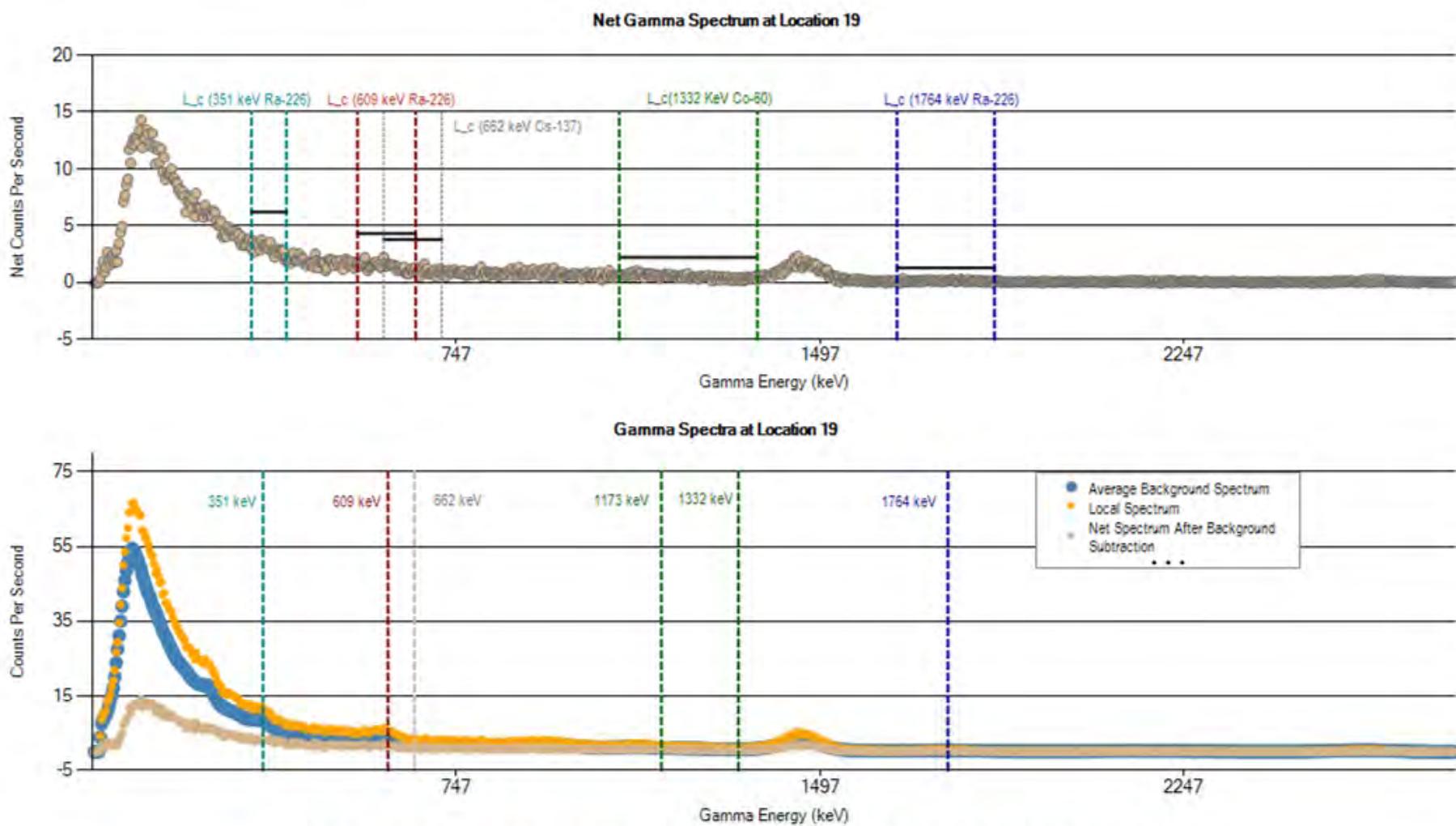
	ROI 1	ROI 2	ROI 3	ROI 4	ROI 5	ROI 6	ROI 7	ROI 8	ROI 9	ROI 10
Location 16 (cps)	1090	138	30	27	194	183	141	230	118	4572
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255



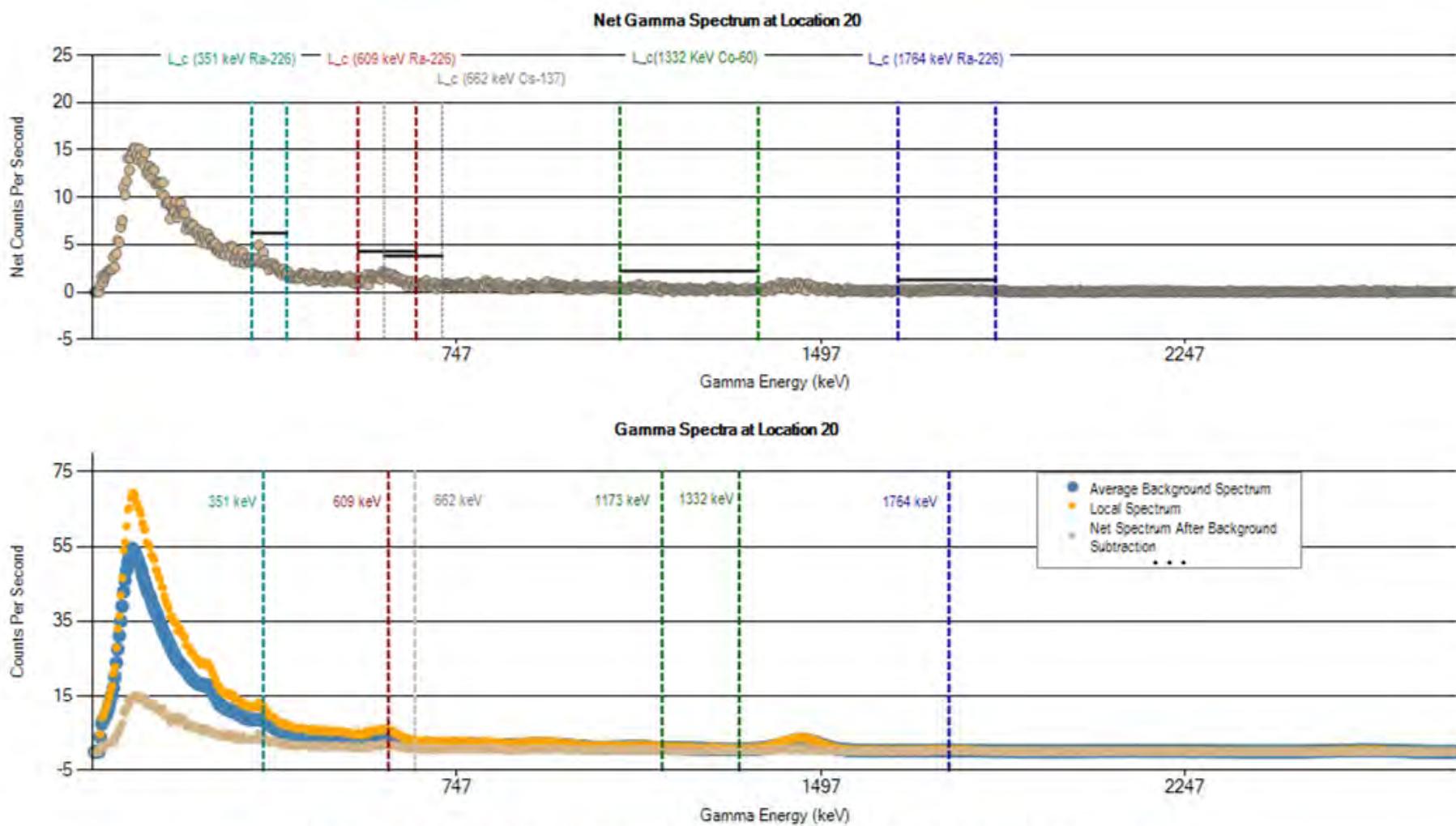
	ROI1	ROI2	ROI3	ROI4	ROI5	ROI6	ROI7	ROI8	ROI9	ROI10
Location 17 (cps)	963	132	22	22	171	157	122	193	108	3949
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255



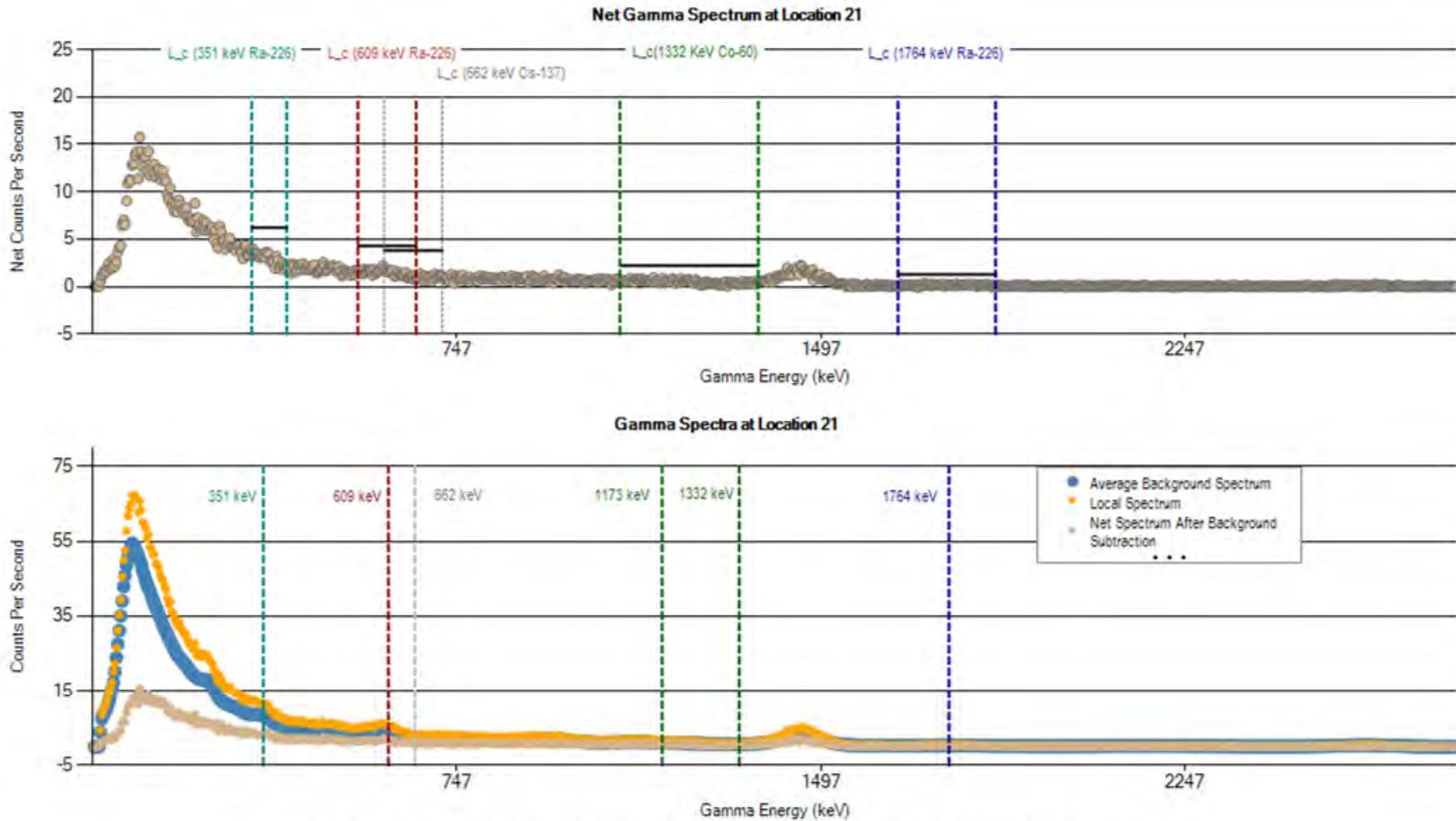
	ROI 1	ROI 2	ROI 3	ROI 4	ROI 5	ROI 6	ROI 7	ROI 8	ROI 9	ROI 10
Location 18 (cps)	1237	175	32	31	213	201	155	251	137	4876
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255



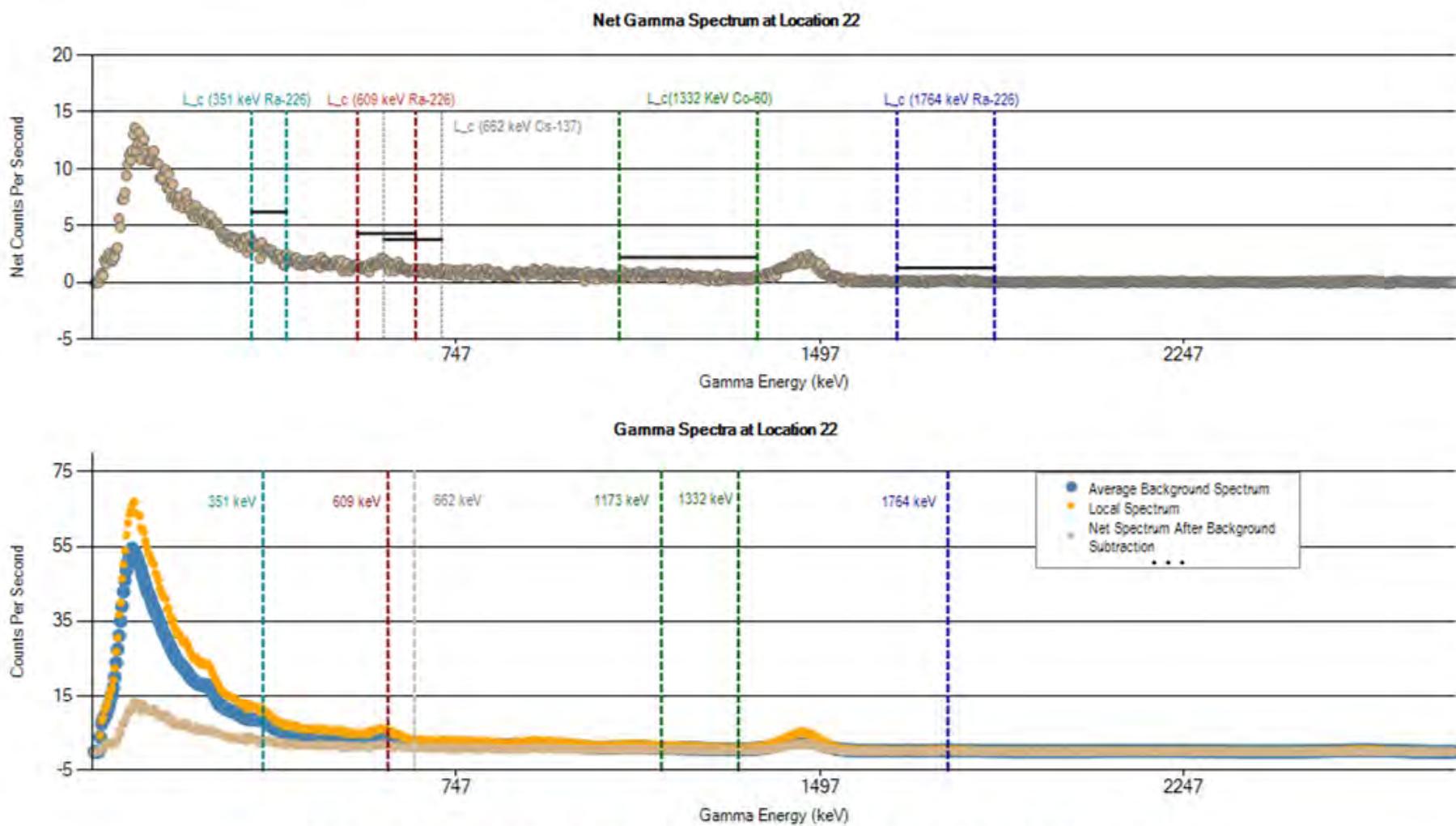
	ROI 1	ROI 2	ROI 3	ROI 4	ROI 5	ROI 6	ROI 7	ROI 8	ROI 9	ROI 10
Location 19 (cps)	1245	179	30	31	216	197	153	247	138	4812
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255



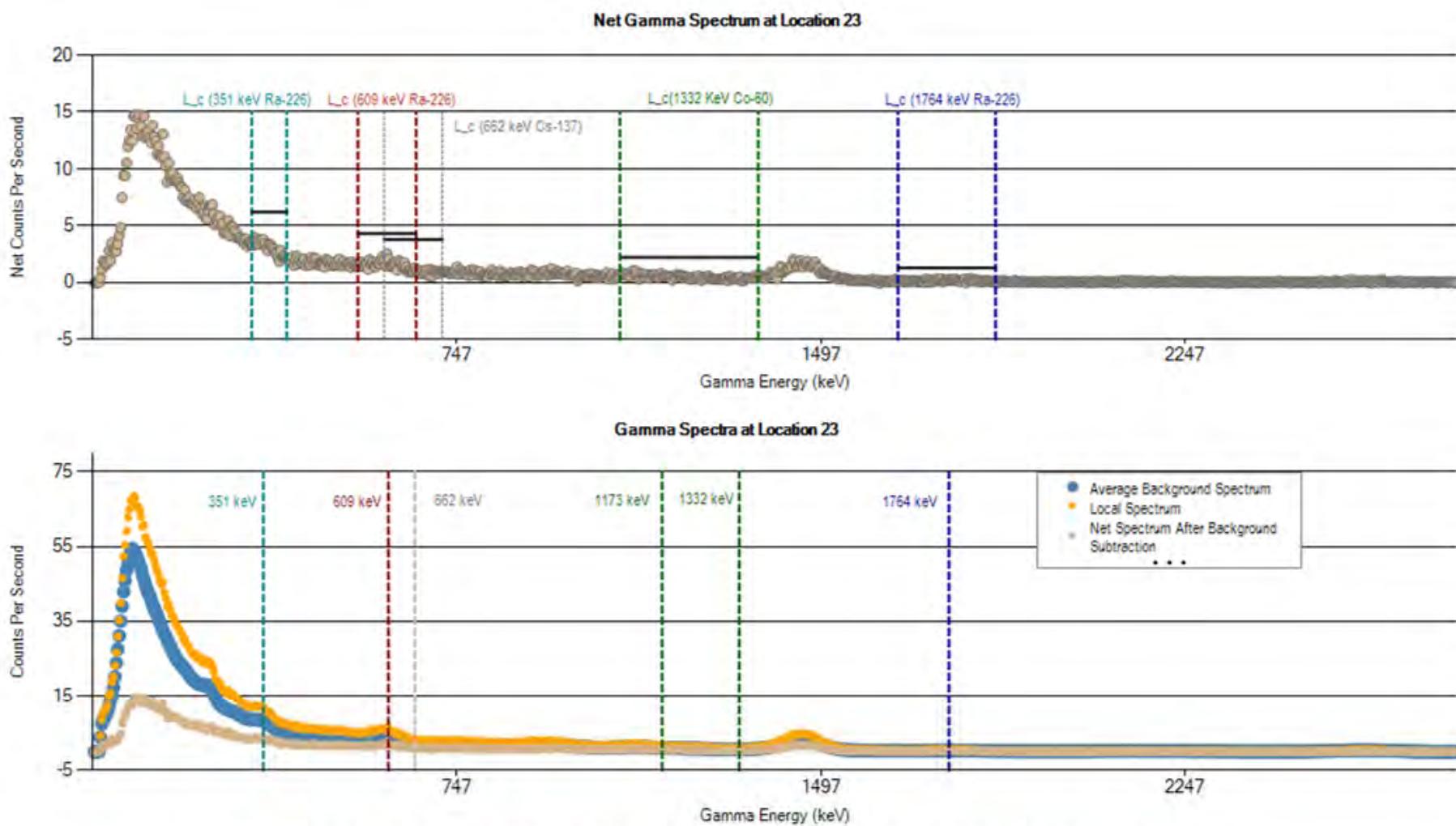
	ROI 1	ROI 2	ROI 3	ROI 4	ROI 5	ROI 6	ROI 7	ROI 8	ROI 9	ROI 10
Location 20 (cps)	1147	142	33	28	204	195	149	246	120	4751
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255



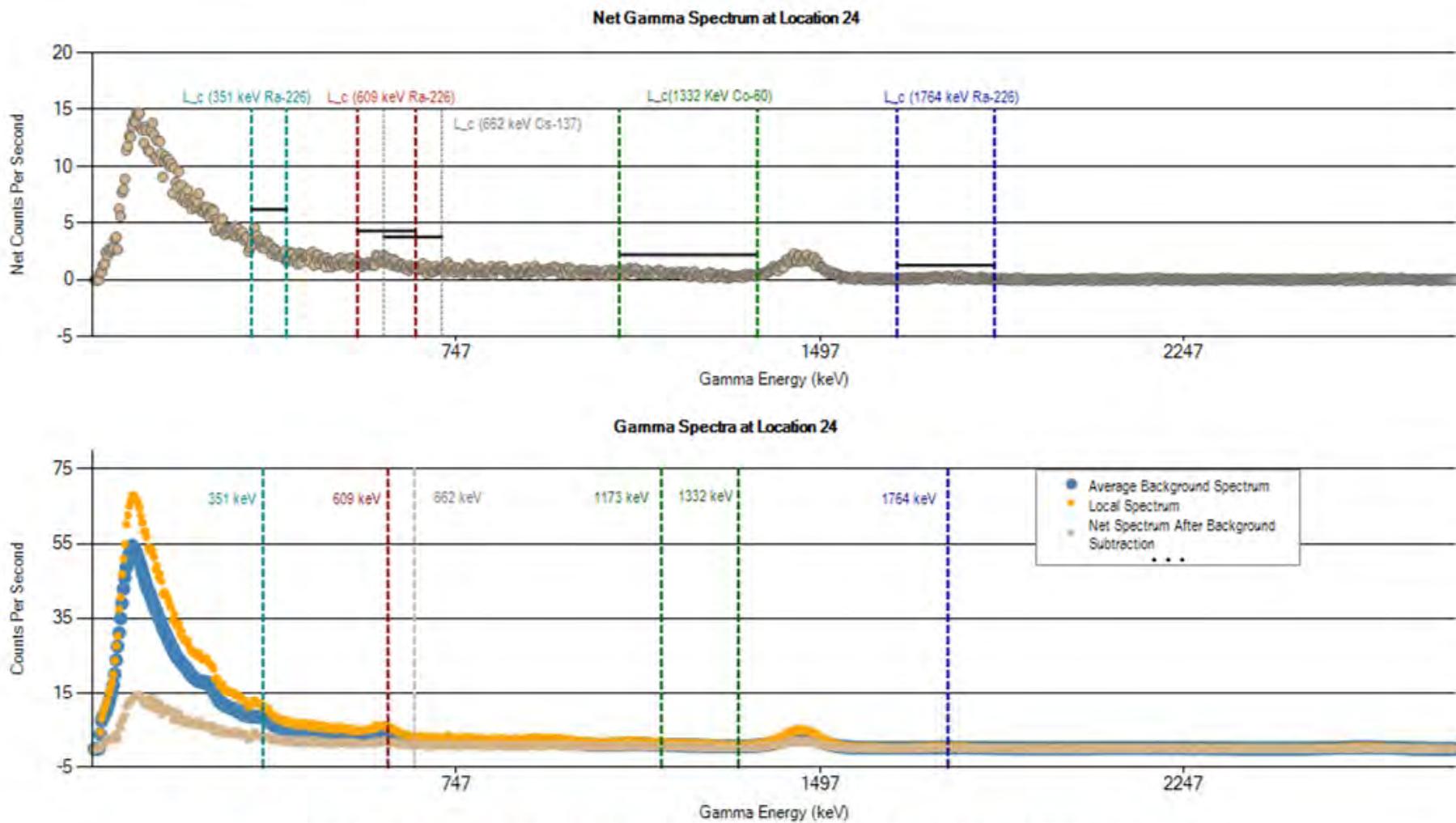
	ROI 1	ROI 2	ROI 3	ROI 4	ROI 5	ROI 6	ROI 7	ROI 8	ROI 9	ROI 10
Location 21 (cps)	1241	177	31	31	217	200	154	246	135	4832
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255



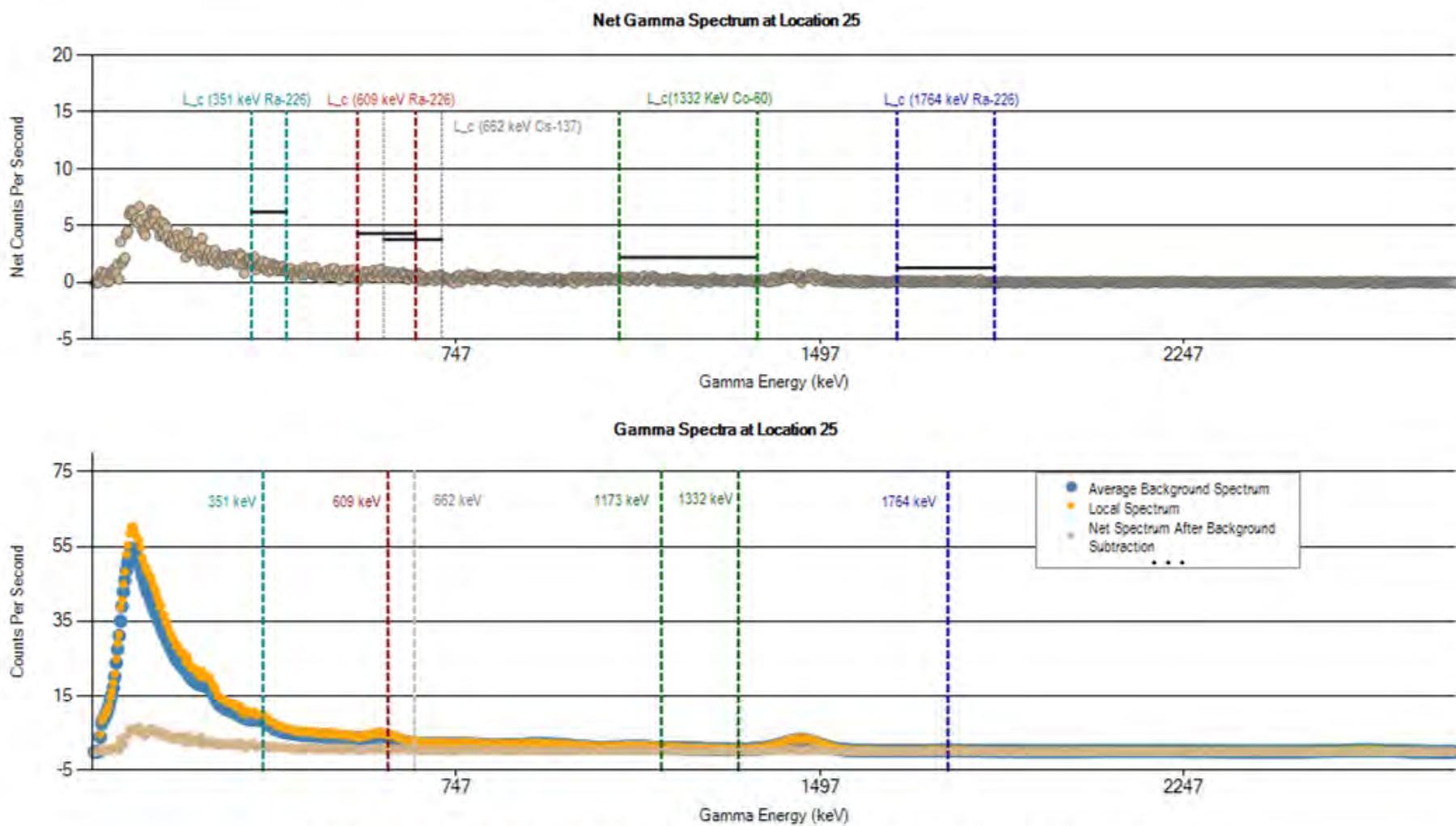
	ROI 1	ROI 2	ROI 3	ROI 4	ROI 5	ROI 6	ROI 7	ROI 8	ROI 9	ROI 10
Location 22 (cps)	1237	185	28	30	210	197	155	240	137	4753
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255



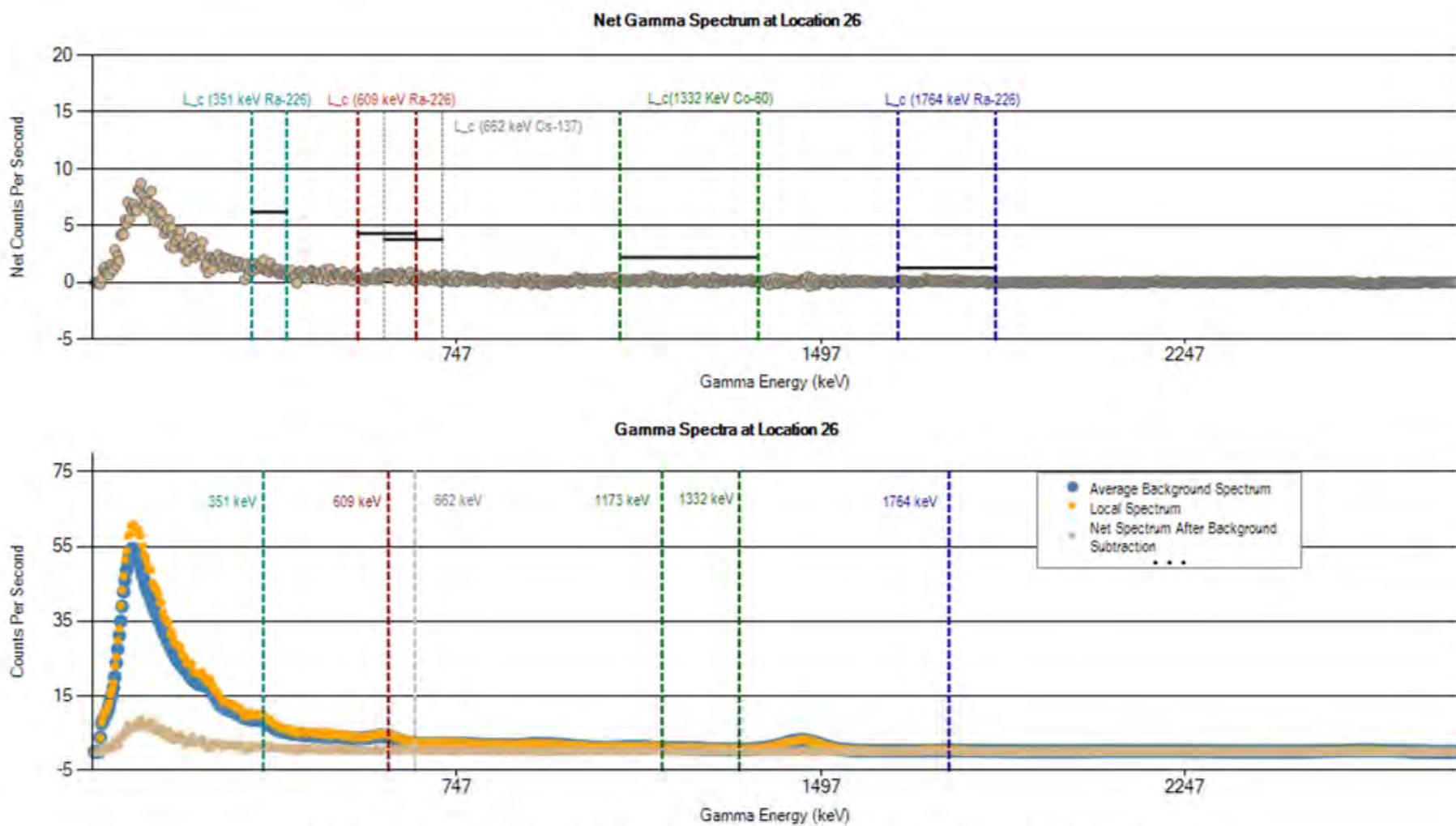
	ROI 1	ROI 2	ROI 3	ROI 4	ROI 5	ROI 6	ROI 7	ROI 8	ROI 9	ROI 10
Location 23 (cps)	1239	177	31	30	215	204	157	248	135	4858
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255



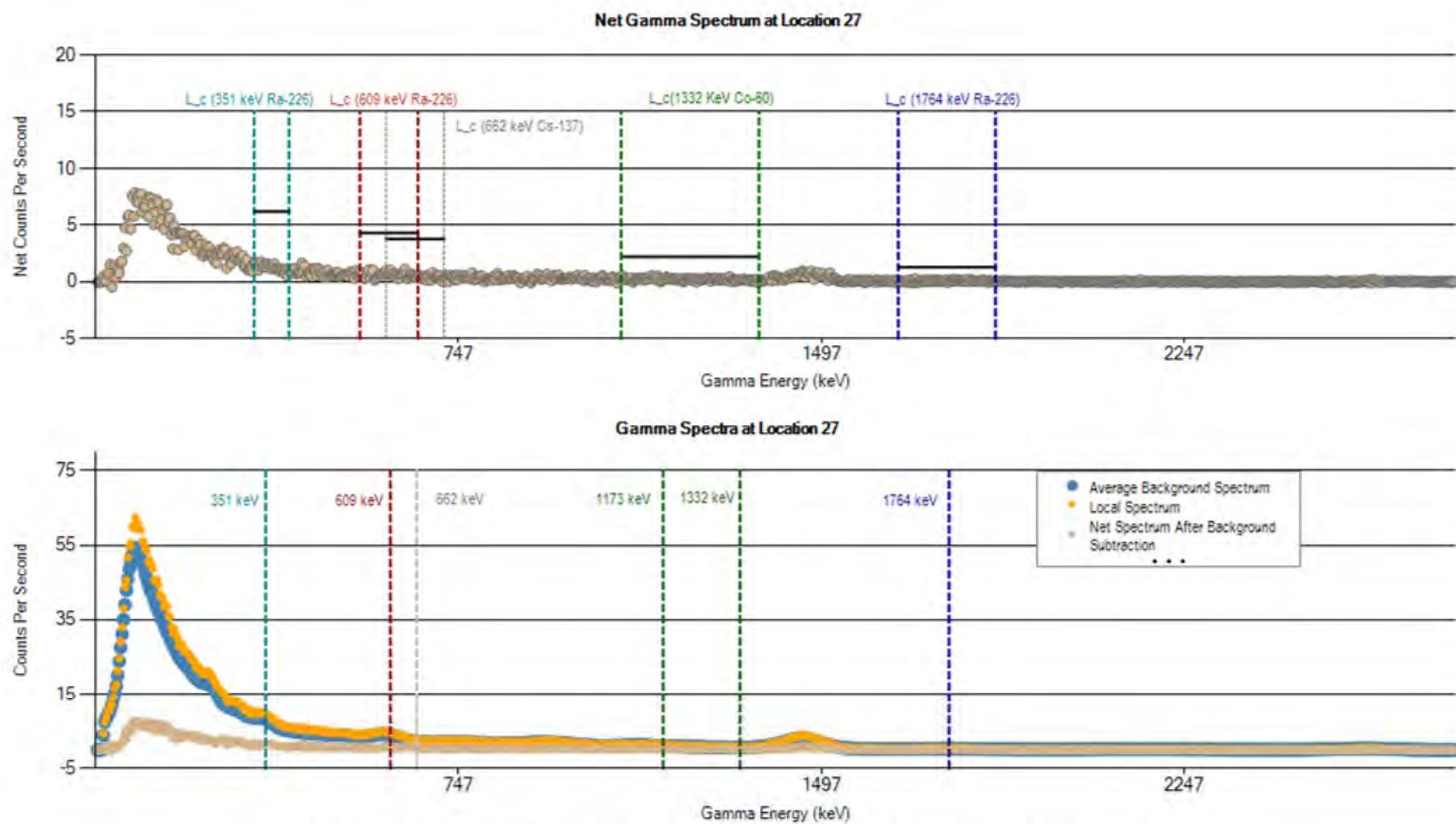
	ROI1	ROI2	ROI3	ROI4	ROI5	ROI6	ROI7	ROI8	ROI9	ROI10
Location 24 (cps)	1248	186	30	30	212	199	155	246	138	4848
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255



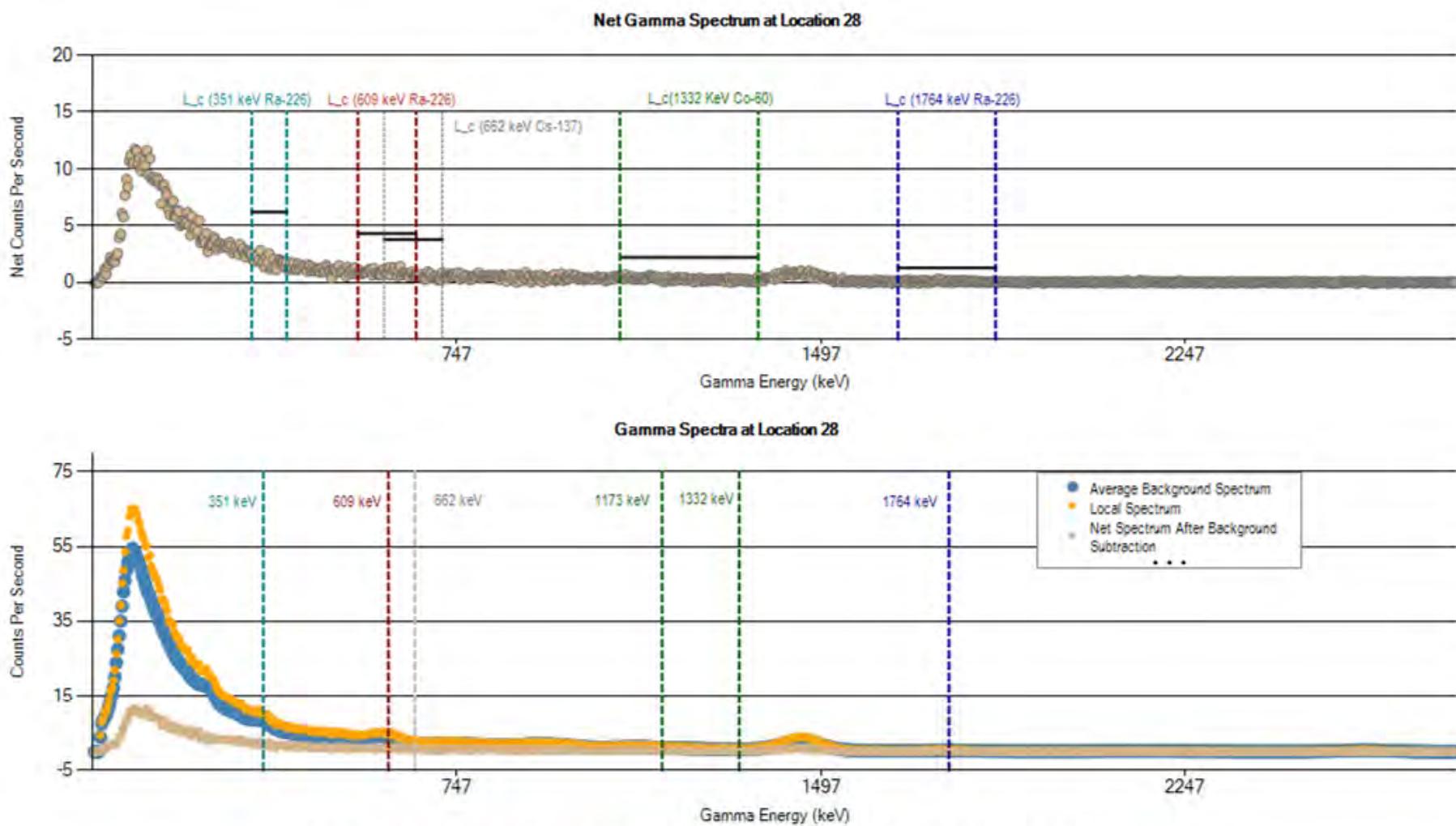
	ROI1	ROI2	ROI3	ROI4	ROI5	ROI6	ROI7	ROI8	ROI9	ROI10
Location 25 (cps)	1018	135	26	26	179	165	128	208	110	4132
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255



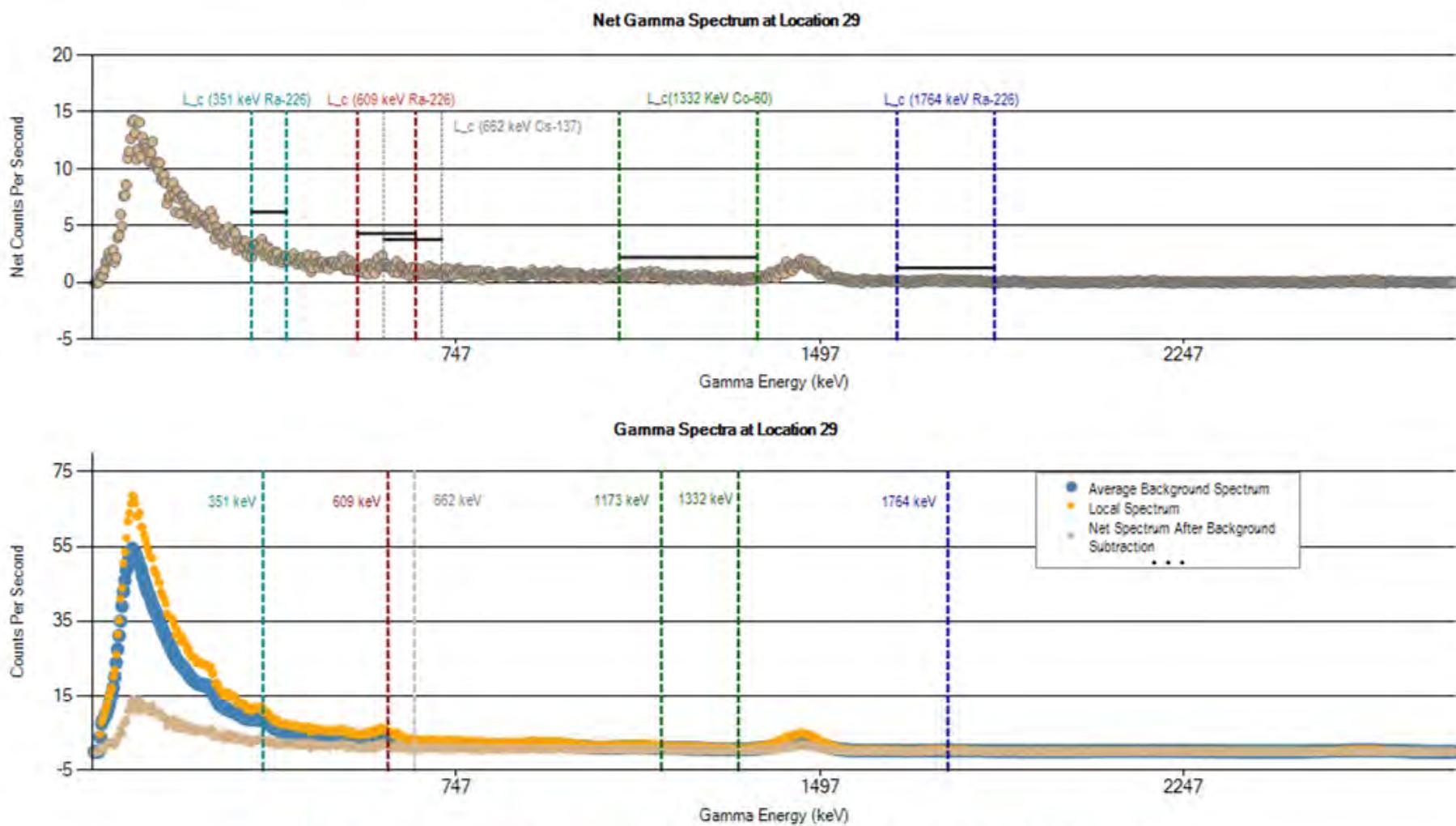
	ROI1	ROI2	ROI3	ROI4	ROI5	ROI6	ROI7	ROI8	ROI9	ROI10
Location 26 (cps)	965	121	27	24	173	159	126	204	106	4111
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255



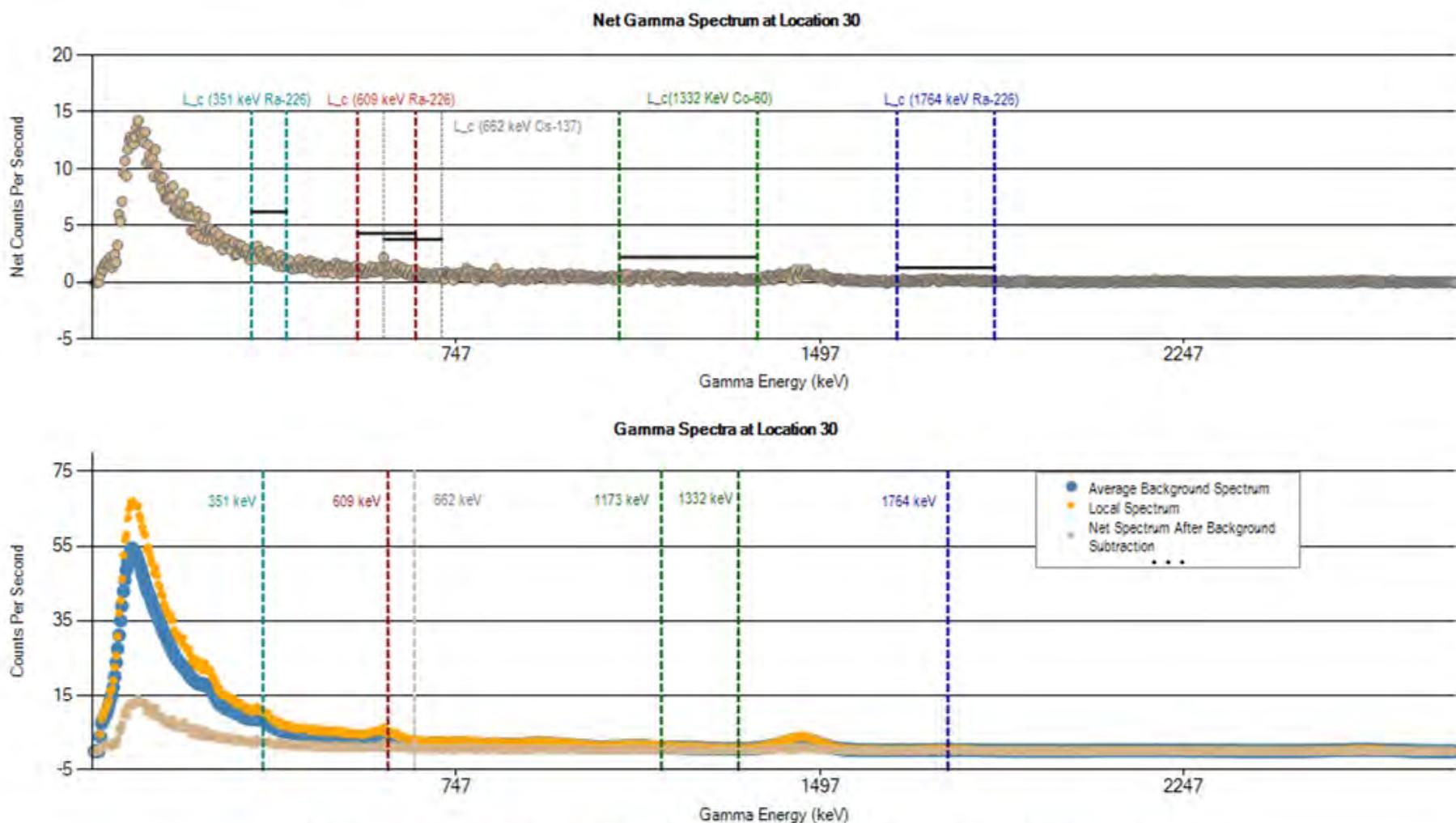
	ROI1	ROI2	ROI3	ROI4	ROI5	ROI6	ROI7	ROI8	ROI9	ROI10
Location 27 (cps)	1020	140	26	27	178	165	128	205	110	4182
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255



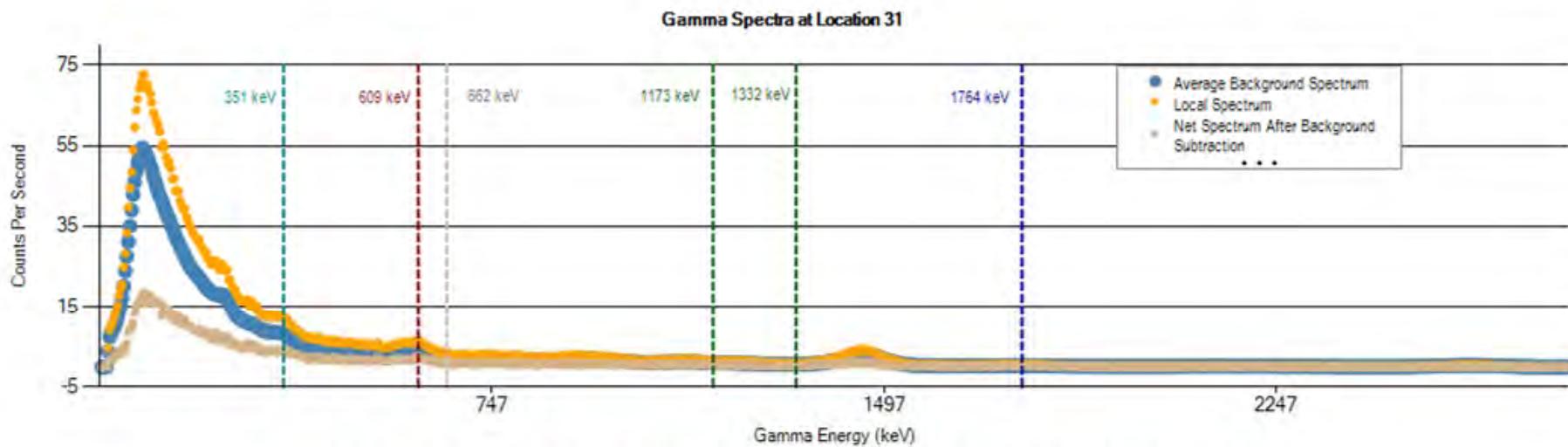
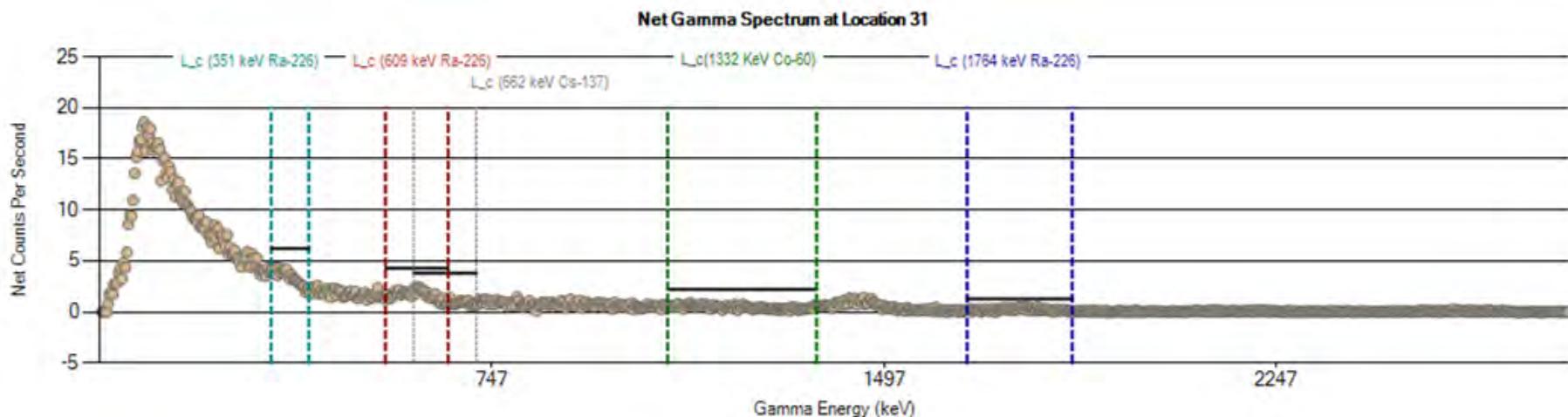
	ROI 1	ROI 2	ROI 3	ROI 4	ROI 5	ROI 6	ROI 7	ROI 8	ROI 9	ROI 10
Location 28 (cps)	1083	147	27	27	192	177	136	220	117	4451
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255



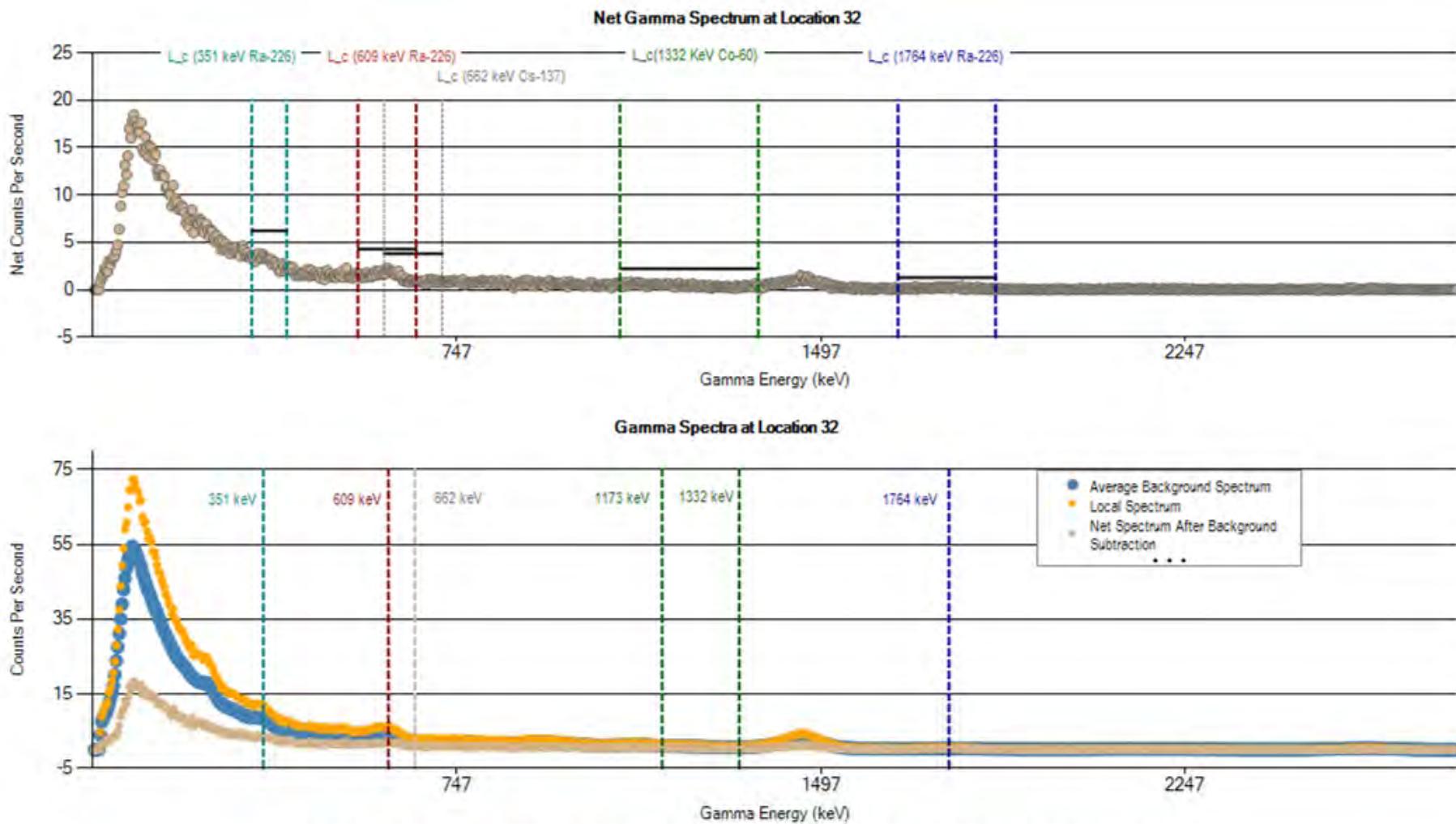
	ROI 1	ROI 2	ROI 3	ROI 4	ROI 5	ROI 6	ROI 7	ROI 8	ROI 9	ROI 10
Location 29 (cps)	1217	175	29	30	210	192	151	240	134	4724
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255



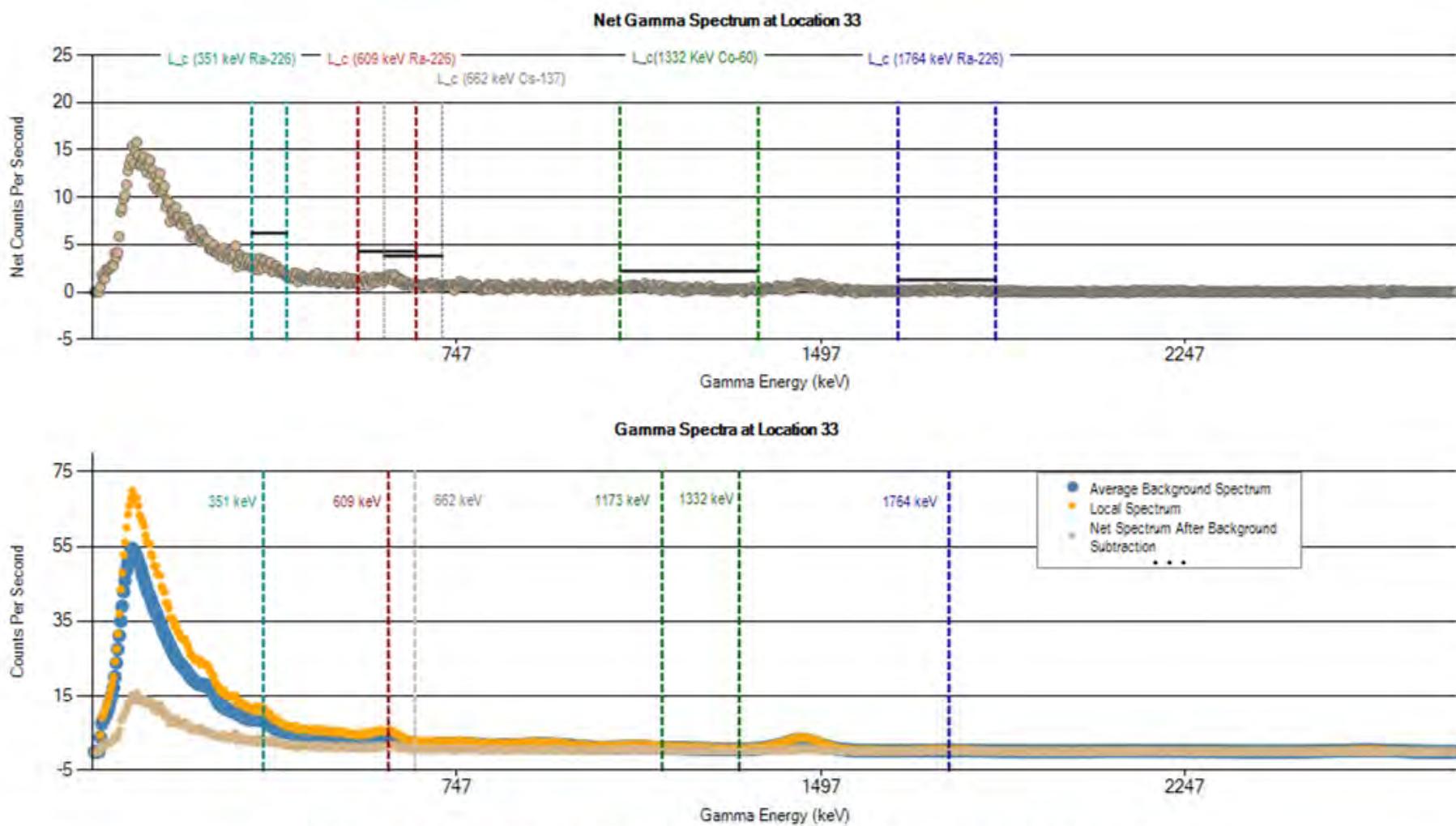
	ROI1	ROI2	ROI3	ROI4	ROI5	ROI6	ROI7	ROI8	ROI9	ROI10
Location 30 (cps)	1119	147	31	28	198	183	140	229	121	4581
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255



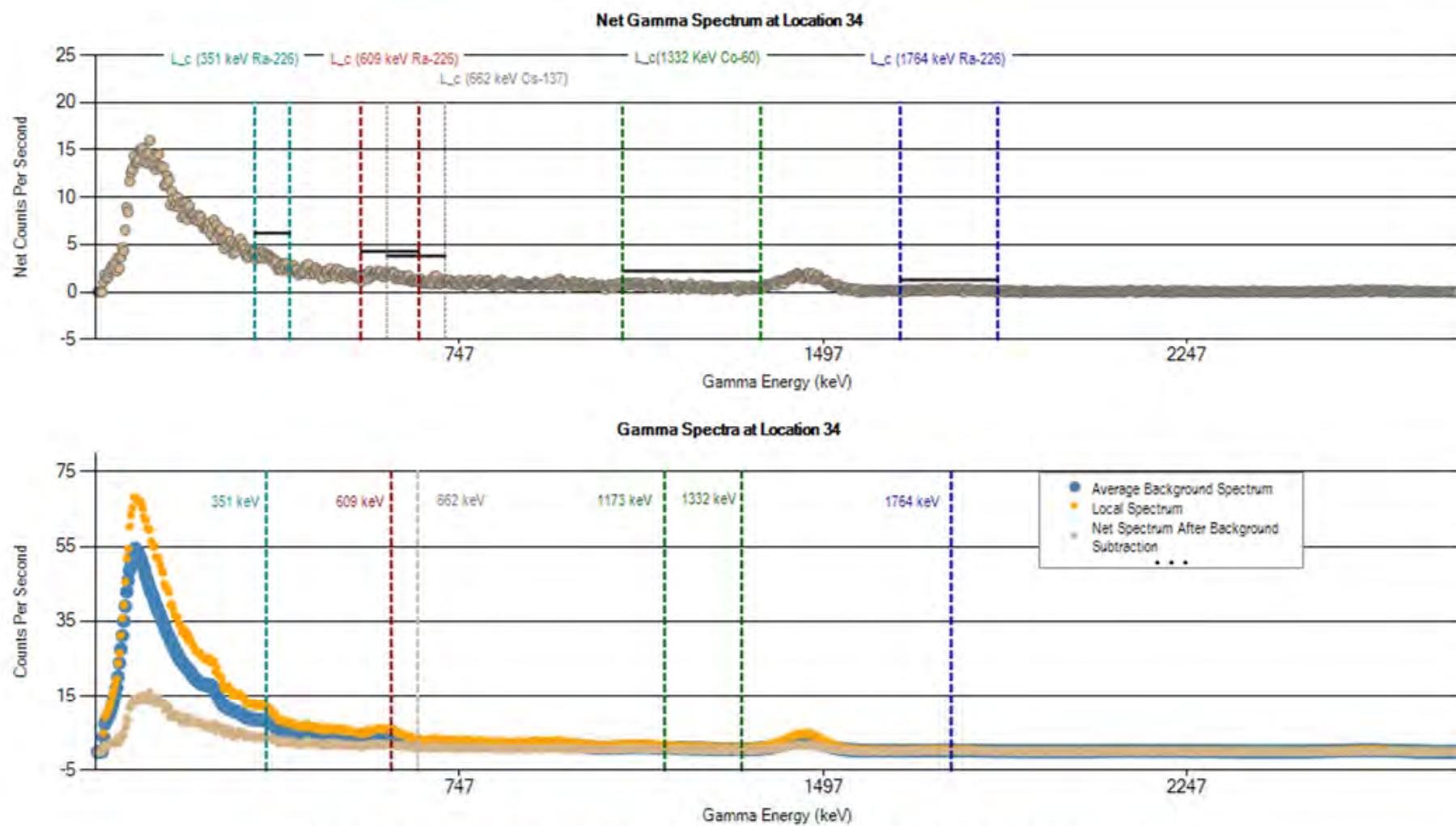
	ROI 1	ROI 2	ROI 3	ROI 4	ROI 5	ROI 6	ROI 7	ROI 8	ROI 9	ROI 10
Location 31 (cps)	1227	157	35	30	217	208	158	257	132	4993
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255



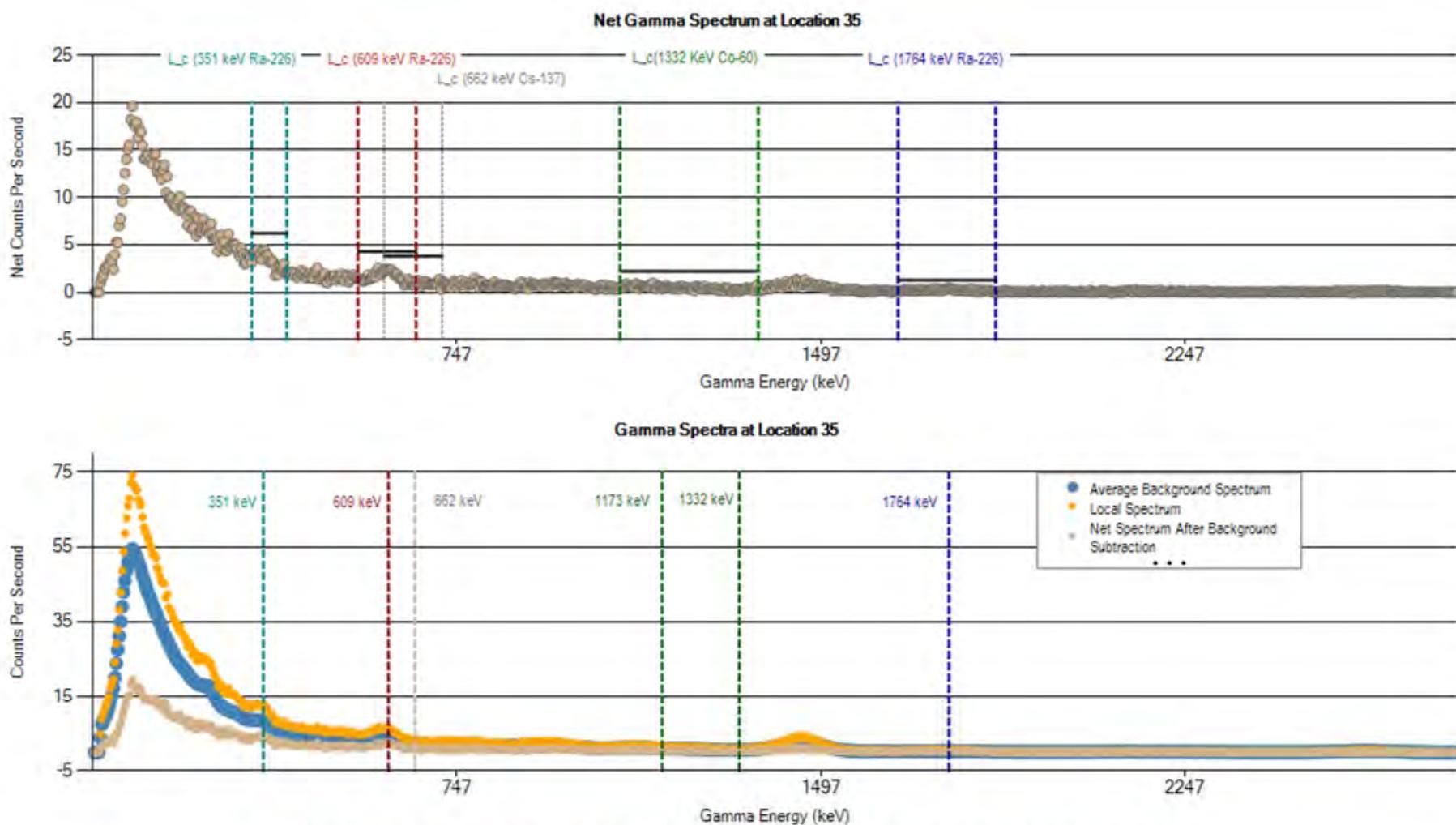
	ROI 1	ROI 2	ROI 3	ROI 4	ROI 5	ROI 6	ROI 7	ROI 8	ROI 9	ROI 10
Location 32 (cps)	1194	157	32	29	211	202	155	248	129	4895
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255



	ROI 1	ROI 2	ROI 3	ROI 4	ROI 5	ROI 6	ROI 7	ROI 8	ROI 9	ROI 10
Location 33 (cps)	1125	142	32	28	200	188	145	239	124	4700
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255



	ROI 1	ROI 2	ROI 3	ROI 4	ROI 5	ROI 6	ROI 7	ROI 8	ROI 9	ROI 10
Location 34 (cps)	1290	185	33	31	223	208	162	255	142	4968
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255



	ROI 1	ROI 2	ROI 3	ROI 4	ROI 5	ROI 6	ROI 7	ROI 8	ROI 9	ROI 10
Location 35 (cps)	1214	154	34	30	212	206	158	255	132	4939
Static IL (cps)	1052	150	35	41	201	189	146	229	120	4255

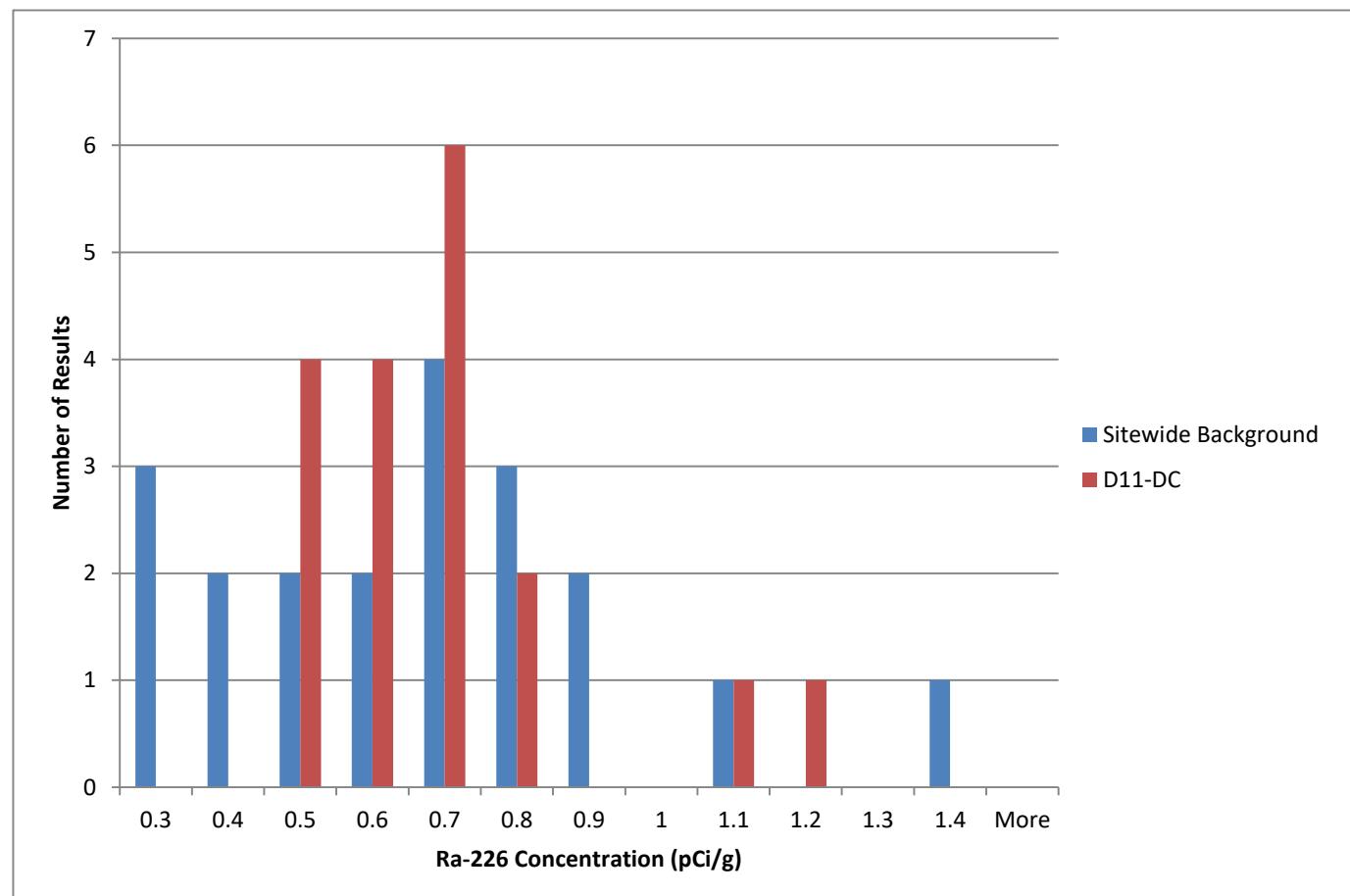
Histogram, RSY D11 (DC) vs. Sitewide Background

Background

Bin	Frequency
0.3	3
0.4	2
0.5	2
0.6	2
0.7	4
0.8	3
0.9	2
1	0
1.1	1
1.2	0
1.3	0
1.4	1
More	0

D11-DC

Bin	Frequency
0.3	0
0.4	0
0.5	4
0.6	4
0.7	6
0.8	2
0.9	0
1	0
1.1	1
1.2	1
1.3	0
1.4	0
More	0



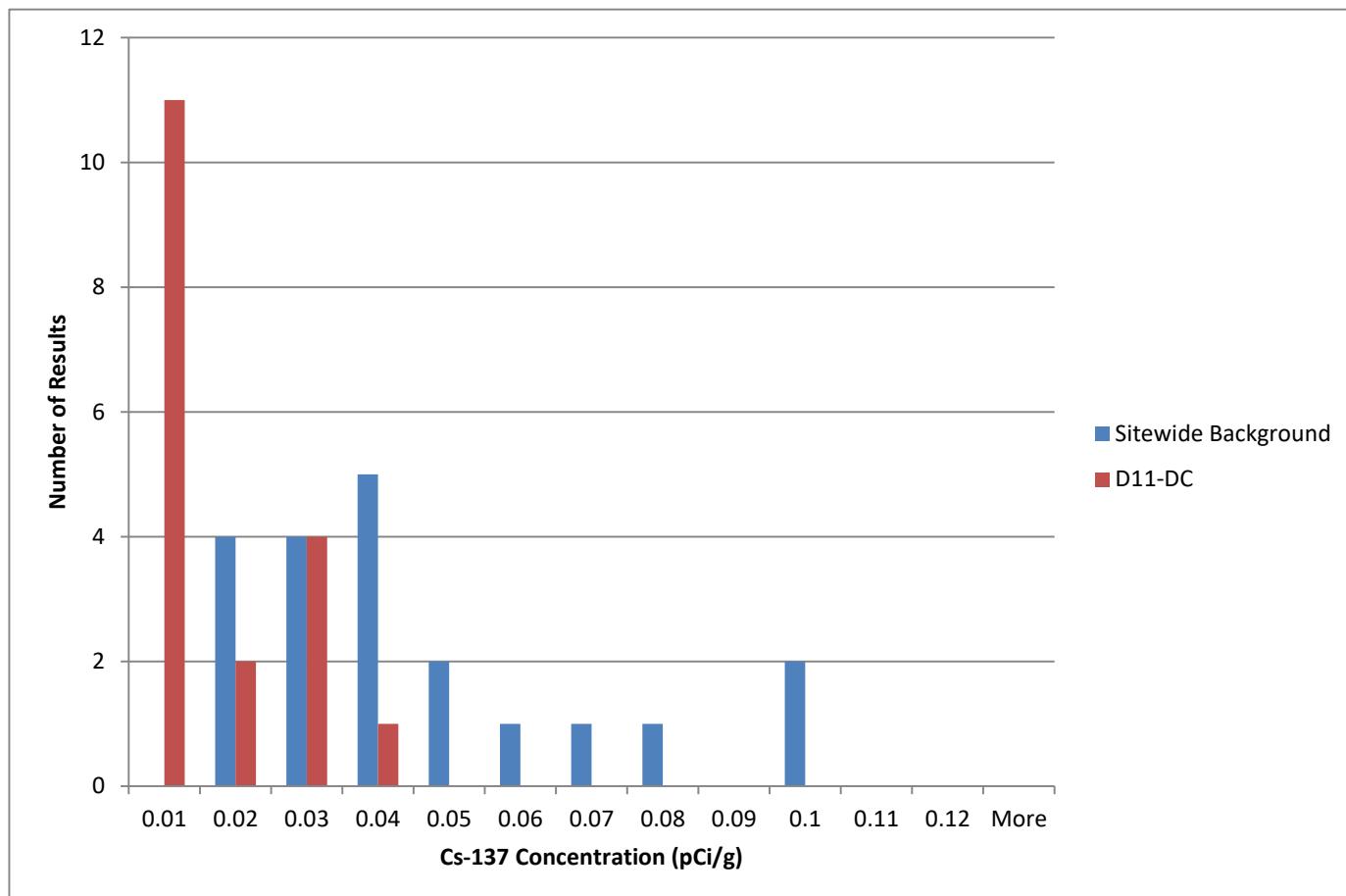
Histogram, RSY D11 (DC) vs. Sitewide Background

Background

Bin	Frequency
0.01	0
0.02	4
0.03	4
0.04	5
0.05	2
0.06	1
0.07	1
0.08	1
0.09	0
0.1	2
0.11	0
0.12	0
More	0

D11-DC

Bin	Frequency
0.01	11
0.02	2
0.03	4
0.04	1
0.05	0
0.06	0
0.07	0
0.08	0
0.09	0
0.1	0
0.11	0
0.12	0
More	0



TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
Tel: (314)298-8566

TestAmerica Job ID: 160-30732-2

Client Project/Site: Hunters Point Naval Shipyard - Parcel E2

For:

Aptim Federal Services LLC
4005 Port Chicago Hwy, Suite 200
Concord, California 94520

Attn: Eddie Kalombo

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Authorized for release by:

10/11/2018 1:20:37 PM

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Tracer Carrier Summary	25

Case Narrative

Client: Optim Federal Services LLC

Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-30732-2

Job ID: 160-30732-2

Laboratory: TestAmerica St. Louis

Narrative

CASE NARRATIVE

Client: Optim Federal Services LLC

Project: Hunters Point Naval Shipyard - Parcel E2

Report Number: 160-30732-2

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

TestAmerica St. Louis attests to the validity of the laboratory data generated by TestAmerica facilities reported herein. All analyses performed by TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the application methods. TestAmerica's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

All solid sample results for Chemistry analyses are reported on an "as received" basis unless otherwise indicated by the presence of a % solids value in the method header. All soil/sediment sample results for radiochemistry analyses are based upon sample as dried and disaggregated with the exception of tritium, carbon-14, and iodine-129 by gamma spectroscopy unless requested as wet weight by the client.

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative.

Reference the chain of custody and condition upon receipt report for any variations on receipt conditions and temperature of samples on receipt.

Manual Integrations were performed only when necessary and are in compliance with the laboratory's standard operating procedure. Detailed information can be found in the raw data section of the level IV report.

The following clean-up methods for Organic analyses may have been used on the samples in this data set. Specific methods employed are documented on the batch extraction logs:

Method 3600C: Cleanup

Method 3620C: Florisil Cleanup

Method 3630C: Silica Gel Cleanup

Method 3640A: Gel-Permeation Cleanup

Method 3650B: Acid-Base Partition Cleanup

Method 3660B: Sulfur Cleanup

Method 3665A: Sulfuric Acid/Permanganate Cleanup

Case Narrative

Client: Aptim Federal Services LLC

Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-30732-2

Job ID: 160-30732-2 (Continued)

Laboratory: TestAmerica St. Louis (Continued)

This laboratory report is confidential and is intended for the sole use of TestAmerica and its client.

RECEIPT

The samples were received on 09/14/2018; the samples arrived in good condition, properly preserved. The temperature of the coolers at receipt was 19.0° C.

TOTAL BETA STRONTIUM (GFPC)

Samples PE2-RSYD11-DC-S001 (160-30732-1) and PE2-RSYD11-DC-S011 (160-30732-11) were analyzed for Total Beta Strontium (GFPC) in accordance with EPA 905. The samples were dried on 09/14/2018, prepared on 09/18/2018 and analyzed on 10/08/2018.

The following samples in batch 160-390125 could not be thoroughly homogenized before sub-sampling was performed due to sample matrix: PE2-RSYD11-DC-S001 (160-30732-1), PE2-RSYD11-DC-S011 (160-30732-11) and (160-30732-A-1-A DU). The samples contained detritus material and rocks of varying sizes.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

RADIUM-226 BY GAMMA SPEC (21 DAY INGROWTH)

Samples PE2-RSYD11-DC-S001 (160-30732-1), PE2-RSYD11-DC-S002 (160-30732-2), PE2-RSYD11-DC-S003 (160-30732-3), PE2-RSYD11-DC-S004 (160-30732-4), PE2-RSYD11-DC-S005 (160-30732-5), PE2-RSYD11-DC-S006 (160-30732-6), PE2-RSYD11-DC-S007 (160-30732-7), PE2-RSYD11-DC-S008 (160-30732-8), PE2-RSYD11-DC-S009 (160-30732-9), PE2-RSYD11-DC-S010 (160-30732-10), PE2-RSYD11-DC-S011 (160-30732-11), PE2-RSYD11-DC-S012 (160-30732-12), PE2-RSYD11-DC-S013 (160-30732-13), PE2-RSYD11-DC-S014 (160-30732-14), PE2-RSYD11-DC-S015 (160-30732-15), PE2-RSYD11-DC-S016 (160-30732-16), PE2-RSYD11-DC-S017 (160-30732-17) and PE2-RSYD11-DC-S018 (160-30732-18) were analyzed for Radium-226 by gamma spec (21 day ingrowth) in accordance with EPA GA_01_R. The samples were dried on 09/14/2018, prepared on 09/18/2018 and analyzed on 10/09/2018.

The cesium-137 detection goal of 0.0700 pCi/g was not met for samples PE2-RSYD11-DC-S001 (160-30732-1), PE2-RSYD11-DC-S004 (160-30732-4), PE2-RSYD11-DC-S007 (160-30732-7), PE2-RSYD11-DC-S013 (160-30732-13), PE2-RSYD11-DC-S014 (160-30732-14), PE2-RSYD11-DC-S015 (160-30732-15) and PE2-RSYD11-DC-S018 (160-30732-18) in batch 160-389963. This is caused by statistical fluctuations in the Compton background due to low level activity in the samples in conjunction with the software attempting to fit a peak into the noise of this baseline.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.



APTIM Federal Services, LLC
400 S Port Chicago Hwy
Concord, CA 94520

CHAIN OF CUSTODY

Project Manager:	Nels Johnson
Phone/Fax Number:	415-987-0760
Address:	4005 Port Chicago Hwy
City:	Concord, CA, 94520

Send Report To: Eddie Kalombo
Project Number: 500506
Project Name: Systematic
Project Location: HPNS - Parcel E-2
Purchase Order #: 202296

(Name & phone #)

Sampler's Name(s):	Taylor Williams
Phone/Fax Number:	415-987-0760
Address:	4005 Port Chicago Hwy
City:	Concord, CA, 94520

(Name & phone #)

Sample ID Number	Sample Description
PE2-RSYD11-DC-S001	Parcel E-2 RSYD11 Deconstruction Systematic
PE2-RSYD11-DC-S002	Parcel E-2 RSYD11 Deconstruction Systematic
PE2-RSYD11-DC-S003	Parcel E-2 RSYD11 Deconstruction Systematic
PE2-RSYD11-DC-S004	Parcel E-2 RSYD11 Deconstruction Systematic
PE2-RSYD11-DC-S005	Parcel E-2 RSYD11 Deconstruction Systematic
PE2-RSYD11-DC-S006	Parcel E-2 RSYD11 Deconstruction Systematic
PE2-RSYD11-DC-S007	Parcel E-2 RSYD11 Deconstruction Systematic
PE2-RSYD11-DC-S008	Parcel E-2 RSYD11 Deconstruction Systematic
PE2-RSYD11-DC-S009	Parcel E-2 RSYD11 Deconstruction Systematic
PE2-RSYD11-DC-S010	Parcel E-2 RSYD11 Deconstruction Systematic

(Name & phone #)

Analyses Requested						
Strontium 90 (EPA 905 M0D)						
Gamma Spec (EPA 1911 M)						
(7 day-in-growth preliminary results and full 21 day in-growth for full gamma results)						
Shipment/Pickup Date:	9.13.18	Waybill Number:	2664549751154	Lab Destination:	TestAmerica (St. Louis Lab) 13715 Rider Trail North Earth City, MO 63045	Total Strontium (EPA 905 M0D)
Lab Contact Name / ph. #:	Rhonda Ridenhower (314) 298-8566	Preservative (Water)		Preservative (Soil)		Dose Rate µR/Hr
Collection Information	Date	Time	Method	# containers	Container Type	
Sample ID Number						

Special Instructions:						
Analyze for Total Strontium as a screening step, and isotopic Sr-90 only if Total Strontium is above project action limit of 0.331 pCi/g.						
<input type="checkbox"/> 24-hr	<input type="checkbox"/> 3-day	<input type="checkbox"/> 10-day	I	II	III	Project Specific:
Relinquished By: J. Taylor Williams	Date: 9-11-18 Time: 14:45	Received By: Taylor Williams	Date: 9-11-18 Time: 14:45	Method Codes 0845	Matrix Codes DW = Drinking Water GW = Ground Water WW = Waste Water A = Air	C = Composite G = Grab SO = Soil SL = Sludge CP = Chip Samples ABS=Asbestos, PO=Pipe Opening
Relinquished By: Taylor Williams	Date: 9.15.18 Time: 1600	Received By: Michael Johnson	Date: 9-14-18 Time: 1600			
Relinquished By: Taylor Williams	Date: Time:	Received By:	Date: Time:			



160-30732 Chain of Custody

Ref. Document # PE2_RSYD11_DC#575

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CHAIN OF CUSTODY

APTIM Federal Services, LLC
4005 Port Chicago Hwy
Concord, CA 94520

Project Number: S00506

Project Name: CTO-013 RSYD11 Deconstruction
Systematic

Project Location: HINNS - Parcel E-2

Purchase Order #: 2022296

Shipment/Pickup Date: 9/13/18

Waybill Number: 1266N5451341591258
Lab Destination: TestAmerica (St. Louis Lab)
13715 Rider Trail North
Earth City, MO 63045

Project Manager: Nels Johnson

(Name & phone #)

Send Report To: Eddie Kalombo

Phone/Fax Number: 415-287-0760

Address: 4005 Port Chicago Hwy

City: Concord, CA, 94520

Sampler's Name(s): Tobin Wells

(Name & phone #)

Phone/Fax Number: 415-287-0760

Address: 4005 Port Chicago Hwy

City: Concord, CA, 94520

Sampler's Name(s): Tobin Wells

(Name & phone #)

Phone/Fax Number: 415-287-0760

Address: 4005 Port Chicago Hwy

City: Concord, CA, 94520

Sample ID Number	Sample Description	Date	Time	Method	Matrix	Container	Container Type
# of containers							
PE2-RSYD11-DC-S011	Parcel E-2 RSYD11 Deconstruction Systematic	9/11/18	1352	G	SO	1	16 oz. plastic jar
PE2-RSYD11-DC-S012	Parcel E-2 RSYD11 Deconstruction Systematic	9/11/18	1357	G	SO	1	16 oz. plastic jar
PE2-RSYD11-DC-S013	Parcel E-2 RSYD11 Deconstruction Systematic	9/11/18	1408	G	SO	1	16 oz. plastic jar
PE2-RSYD11-DC-S014	Parcel E-2 RSYD11 Deconstruction Systematic	9/11/18	1417	G	SO	1	16 oz. plastic jar
PE2-RSYD11-DC-S015	Parcel E-2 RSYD11 Deconstruction Systematic	9/11/18	1236	G	SO	1	16 oz. plastic jar
PE2-RSYD11-DC-S016	Parcel E-2 RSYD11 Deconstruction Systematic	9/11/18	1425	G	SO	1	16 oz. plastic jar
PE2-RSYD11-DC-S017	Parcel E-2 RSYD11 Deconstruction Systematic	9/11/18	1432	G	SO	1	16 oz. plastic jar
PE2-RSYD11-DC-S018	Parcel E-2 RSYD11 Deconstruction Systematic	9/11/18	1230	G	SO	1	16 oz. plastic jar

Special Instructions:

Analyze for Total Strontium

7 days ingrown draft and follow with 21 days final.

Level Of QC Required:

24-hr

3-day

10-day

I

II

III

Project Specific:

Relinquished By: <u>Tobin Wells</u>	Date: 9/11/18 Time: 1445	Received By: <u>Tobin Wells</u>	Date: 9/11/18 Time: 1445	Method Codes Date: 9/14/18 Time: 0845	Matrix Codes DW = Drinking Water GW = Ground Water WW = Waste Water
Relinquished By: <u>Tobin Wells</u>	Date: 9/15/18 Time: 1600	Received By: <u>Tobin Wells</u>	Date: 9/14/18 Time: 0845	Method Codes Date: 9/14/18 Time: 0845	Matrix Codes DW = Drinking Water GW = Ground Water WW = Waste Water
Relinquished By: <u>Tobin Wells</u>	Date: 9/15/18 Time: 1600	Received By: <u>Tobin Wells</u>	Date: 9/14/18 Time: 0845	Method Codes Date: 9/14/18 Time: 0845	Matrix Codes DW = Drinking Water GW = Ground Water WW = Waste Water

A = Air

ABS=Asbestos, PO=Pipe Opening

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Login Sample Receipt Checklist

Client: Aptim Federal Services LLC

Job Number: 160-30732-2

Login Number: 30732**List Number: 1****Creator: Press, Nicholas B****List Source: TestAmerica St. Louis****Question****Answer****Comment**

Radioactivity wasn't checked or is </= background as measured by a survey meter.

True

The cooler's custody seal, if present, is intact.

True

Sample custody seals, if present, are intact.

True

The cooler or samples do not appear to have been compromised or tampered with.

True

Samples were received on ice.

N/A

Cooler Temperature is acceptable.

True

Cooler Temperature is recorded.

True

COC is present.

True

COC is filled out in ink and legible.

True

COC is filled out with all pertinent information.

True

Is the Field Sampler's name present on COC?

True

There are no discrepancies between the containers received and the COC.

True

Samples are received within Holding Time (excluding tests with immediate HTs)

True

Sample containers have legible labels.

True

Containers are not broken or leaking.

True

Sample collection date/times are provided.

True

Appropriate sample containers are used.

True

Sample bottles are completely filled.

True

Sample Preservation Verified.

N/A

There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs

True

Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").

N/A

Multiphasic samples are not present.

True

Samples do not require splitting or compositing.

True

Residual Chlorine Checked.

N/A

Definitions/Glossary

Client: Aptim Federal Services LLC
 Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-30732-2

Qualifiers

Rad

Qualifier	Qualifier Description
U	Undetected at the Limit of Detection.

Glossary

Abbreviation

These commonly used abbreviations may or may not be present in this report.

□	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Method Summary

Client: Aptim Federal Services LLC

Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-30732-2

Method	Method Description	Protocol	Laboratory
905.0	Total Beta Strontium (GFPC)	DOE	TAL SL
GA-01-R	Radium-226 & Other Gamma Emitters (GS)	DOE	TAL SL
DPS-0	Preparation, Digestion/ Precipitate	None	TAL SL
Dry and Grind	Preparation, Dry and Grind	None	TAL SL
Fill_Geo-21	Fill Geometry, 21-Day In-Growth	None	TAL SL

Protocol References:

DOE = U.S. Department of Energy

None = None

Laboratory References:

TAL SL = TestAmerica St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

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Sample Summary

Client: Aptim Federal Services LLC

Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-30732-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
160-30732-1	PE2-RSYD11-DC-S001	Solid	09/11/18 12:43	09/14/18 08:45
160-30732-2	PE2-RSYD11-DC-S002	Solid	09/11/18 12:49	09/14/18 08:45
160-30732-3	PE2-RSYD11-DC-S003	Solid	09/11/18 12:56	09/14/18 08:45
160-30732-4	PE2-RSYD11-DC-S004	Solid	09/11/18 13:03	09/14/18 08:45
160-30732-5	PE2-RSYD11-DC-S005	Solid	09/11/18 13:10	09/14/18 08:45
160-30732-6	PE2-RSYD11-DC-S006	Solid	09/11/18 13:17	09/14/18 08:45
160-30732-7	PE2-RSYD11-DC-S007	Solid	09/11/18 13:24	09/14/18 08:45
160-30732-8	PE2-RSYD11-DC-S008	Solid	09/11/18 13:31	09/14/18 08:45
160-30732-9	PE2-RSYD11-DC-S009	Solid	09/11/18 13:38	09/14/18 08:45
160-30732-10	PE2-RSYD11-DC-S010	Solid	09/11/18 13:45	09/14/18 08:45
160-30732-11	PE2-RSYD11-DC-S011	Solid	09/11/18 13:52	09/14/18 08:45
160-30732-12	PE2-RSYD11-DC-S012	Solid	09/11/18 13:59	09/14/18 08:45
160-30732-13	PE2-RSYD11-DC-S013	Solid	09/11/18 14:08	09/14/18 08:45
160-30732-14	PE2-RSYD11-DC-S014	Solid	09/11/18 14:17	09/14/18 08:45
160-30732-15	PE2-RSYD11-DC-S015	Solid	09/11/18 12:36	09/14/18 08:45
160-30732-16	PE2-RSYD11-DC-S016	Solid	09/11/18 14:25	09/14/18 08:45
160-30732-17	PE2-RSYD11-DC-S017	Solid	09/11/18 14:32	09/14/18 08:45
160-30732-18	PE2-RSYD11-DC-S018	Solid	09/11/18 12:30	09/14/18 08:45

Client Sample Results

Client: Aptim Federal Services LLC

Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-30732-2

Client Sample ID: PE2-RSYD11-DC-S001**Lab Sample ID: 160-30732-1**

Date Collected: 09/11/18 12:43

Matrix: Solid

Date Received: 09/14/18 08:45

Method: 905.0 - Total Beta Strontium (GFPC)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Total Beta Strontium	0.101		0.0679	0.0683	0.331	0.0474	pCi/g	09/18/18 18:36	10/08/18 04:45	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Sr Carrier	88.5		40 - 110					09/18/18 18:36	10/08/18 04:45	1

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Actinium 228	0.919		0.208	0.228		0.0761	pCi/g	09/18/18 09:24	10/09/18 11:26	1
Actinium-227	-0.451	U	0.892	0.893		0.541	pCi/g	09/18/18 09:24	10/09/18 11:26	1
Bismuth-212	-0.182	U	1.11	1.11		0.901	pCi/g	09/18/18 09:24	10/09/18 11:26	1
Bismuth-214	0.747		0.212	0.225		0.0789	pCi/g	09/18/18 09:24	10/09/18 11:26	1
Cesium-137	0.0343	U	0.0930	0.0931	0.0700	0.0742	pCi/g	09/18/18 09:24	10/09/18 11:26	1
Cobalt-60	0.0385		0.0699	0.0700	0.200	0.0315	pCi/g	09/18/18 09:24	10/09/18 11:26	1
Lead-210	1.84		1.92	1.94		1.21	pCi/g	09/18/18 09:24	10/09/18 11:26	1
Lead-212	0.789		0.131	0.154		0.0635	pCi/g	09/18/18 09:24	10/09/18 11:26	1
Lead-214	0.827		0.155	0.176		0.0711	pCi/g	09/18/18 09:24	10/09/18 11:26	1
Potassium-40	19.9		2.18	2.96		0.361	pCi/g	09/18/18 09:24	10/09/18 11:26	1
Protactinium-231	0.000	U	0.621	0.621		2.98	pCi/g	09/18/18 09:24	10/09/18 11:26	1
Radium-226	0.747		0.212	0.225	0.700	0.0789	pCi/g	09/18/18 09:24	10/09/18 11:26	1
Radium-228	0.919		0.208	0.228		0.0761	pCi/g	09/18/18 09:24	10/09/18 11:26	1
Thallium-208	0.330		0.0745	0.0817		0.0150	pCi/g	09/18/18 09:24	10/09/18 11:26	1
Thorium-228	0.789		0.131	0.154		0.0635	pCi/g	09/18/18 09:24	10/09/18 11:26	1
Thorium-232	0.919		0.208	0.228		0.0761	pCi/g	09/18/18 09:24	10/09/18 11:26	1
Thorium-234	0.337	U	0.601	0.602		0.586	pCi/g	09/18/18 09:24	10/09/18 11:26	1
Uranium-235	-0.0223	U	0.406	0.406		0.689	pCi/g	09/18/18 09:24	10/09/18 11:26	1
Uranium-238	0.337	U	0.601	0.602		0.586	pCi/g	09/18/18 09:24	10/09/18 11:26	1

Client Sample ID: PE2-RSYD11-DC-S002**Lab Sample ID: 160-30732-2**

Date Collected: 09/11/18 12:49

Matrix: Solid

Date Received: 09/14/18 08:45

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Actinium 228	0.810		0.222	0.236		0.117	pCi/g	09/18/18 09:24	10/09/18 12:05	1
Actinium-227	-0.503	U	0.938	0.940		0.569	pCi/g	09/18/18 09:24	10/09/18 12:05	1
Bismuth-212	1.69		0.697	0.719		0.220	pCi/g	09/18/18 09:24	10/09/18 12:05	1
Bismuth-214	0.592		0.141	0.154		0.0455	pCi/g	09/18/18 09:24	10/09/18 12:05	1
Cesium-137	0.0334	U	0.0622	0.0623	0.0700	0.0478	pCi/g	09/18/18 09:24	10/09/18 12:05	1
Cobalt-60	0.0261	U	0.0669	0.0669	0.200	0.0322	pCi/g	09/18/18 09:24	10/09/18 12:05	1
Lead-210	-1.43	U	1.46	1.47		1.51	pCi/g	09/18/18 09:24	10/09/18 12:05	1
Lead-212	0.764		0.148	0.178		0.0679	pCi/g	09/18/18 09:24	10/09/18 12:05	1
Lead-214	0.0987	U	0.0679	0.0686		0.183	pCi/g	09/18/18 09:24	10/09/18 12:05	1
Potassium-40	16.0		2.07	2.64		0.325	pCi/g	09/18/18 09:24	10/09/18 12:05	1
Protactinium-231	0.739	U	2.11	2.12		2.32	pCi/g	09/18/18 09:24	10/09/18 12:05	1

Client Sample Results

Client: Aptim Federal Services LLC

Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-30732-2

Client Sample ID: PE2-RSYD11-DC-S002**Lab Sample ID: 160-30732-2**

Date Collected: 09/11/18 12:49

Matrix: Solid

Date Received: 09/14/18 08:45

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS) (Continued)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Radium-226	0.592		0.141	0.154	0.700	0.0455	pCi/g	09/18/18 09:24	10/09/18 12:05	1
Radium-228	0.810		0.222	0.236		0.117	pCi/g	09/18/18 09:24	10/09/18 12:05	1
Thallium-208	0.227		0.0741	0.0778		0.0307	pCi/g	09/18/18 09:24	10/09/18 12:05	1
Thorium-228	0.764		0.148	0.178		0.0679	pCi/g	09/18/18 09:24	10/09/18 12:05	1
Thorium-232	0.810		0.222	0.236		0.117	pCi/g	09/18/18 09:24	10/09/18 12:05	1
Thorium-234	0.0629 U		0.609	0.609		1.20	pCi/g	09/18/18 09:24	10/09/18 12:05	1
Uranium-235	0.0883 U		0.293	0.293		0.549	pCi/g	09/18/18 09:24	10/09/18 12:05	1
Uranium-238	0.0629 U		0.609	0.609		1.20	pCi/g	09/18/18 09:24	10/09/18 12:05	1

Client Sample ID: PE2-RSYD11-DC-S003**Lab Sample ID: 160-30732-3**

Date Collected: 09/11/18 12:56

Matrix: Solid

Date Received: 09/14/18 08:45

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.563		0.163	0.173		0.0294	pCi/g	09/18/18 09:24	10/09/18 12:07	1
Actinium-227	0.0256 U		0.0862	0.0863		0.356	pCi/g	09/18/18 09:24	10/09/18 12:07	1
Bismuth-212	0.101 U		0.758	0.758		0.615	pCi/g	09/18/18 09:24	10/09/18 12:07	1
Bismuth-214	0.652		0.174	0.187		0.0629	pCi/g	09/18/18 09:24	10/09/18 12:07	1
Cesium-137	0.0284 U		0.0638	0.0638	0.0700	0.0500	pCi/g	09/18/18 09:24	10/09/18 12:07	1
Cobalt-60	0.0225		0.0236	0.0237	0.200	0.0116	pCi/g	09/18/18 09:24	10/09/18 12:07	1
Lead-210	0.443 U		1.32	1.32		0.843	pCi/g	09/18/18 09:24	10/09/18 12:07	1
Lead-212	0.335		0.0852	0.0956		0.0473	pCi/g	09/18/18 09:24	10/09/18 12:07	1
Lead-214	0.522		0.113	0.125		0.0522	pCi/g	09/18/18 09:24	10/09/18 12:07	1
Potassium-40	7.44		1.26	1.47		0.230	pCi/g	09/18/18 09:24	10/09/18 12:07	1
Protactinium-231	0.000 U		0.762	0.762		1.97	pCi/g	09/18/18 09:24	10/09/18 12:07	1
Radium-226	0.652		0.174	0.187	0.700	0.0629	pCi/g	09/18/18 09:24	10/09/18 12:07	1
Radium-228	0.563		0.163	0.173		0.0294	pCi/g	09/18/18 09:24	10/09/18 12:07	1
Thallium-208	0.162		0.0664	0.0685		0.0275	pCi/g	09/18/18 09:24	10/09/18 12:07	1
Thorium-228	0.335		0.0852	0.0956		0.0473	pCi/g	09/18/18 09:24	10/09/18 12:07	1
Thorium-232	0.563		0.163	0.173		0.0294	pCi/g	09/18/18 09:24	10/09/18 12:07	1
Thorium-234	0.674		0.504	0.509		0.363	pCi/g	09/18/18 09:24	10/09/18 12:07	1
Uranium-235	-0.0161 U		0.0260	0.0261		0.197	pCi/g	09/18/18 09:24	10/09/18 12:07	1
Uranium-238	0.674		0.504	0.509		0.363	pCi/g	09/18/18 09:24	10/09/18 12:07	1

Client Sample ID: PE2-RSYD11-DC-S004**Lab Sample ID: 160-30732-4**

Date Collected: 09/11/18 13:03

Matrix: Solid

Date Received: 09/14/18 08:45

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.559		0.243	0.250		0.167	pCi/g	09/18/18 09:24	10/09/18 17:45	1
Actinium-227	-0.0352 U		0.607	0.607		0.377	pCi/g	09/18/18 09:24	10/09/18 17:45	1
Bismuth-212	0.175 U		0.811	0.811		0.652	pCi/g	09/18/18 09:24	10/09/18 17:45	1

Client Sample Results

Client: Aptim Federal Services LLC

Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-30732-2

Client Sample ID: PE2-RSYD11-DC-S004**Lab Sample ID: 160-30732-4**

Date Collected: 09/11/18 13:03

Matrix: Solid

Date Received: 09/14/18 08:45

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS) (Continued)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Bismuth-214	0.680		0.172	0.185		0.0546	pCi/g	09/18/18 09:24	10/09/18 17:45	1
Cesium-137	-0.0418	U	0.0895	0.0896	0.0700	0.0710	pCi/g	09/18/18 09:24	10/09/18 17:45	1
Cobalt-60	0.00336	U	0.0800	0.0800	0.200	0.0395	pCi/g	09/18/18 09:24	10/09/18 17:45	1
Lead-210	0.998		1.33	1.33		0.945	pCi/g	09/18/18 09:24	10/09/18 17:45	1
Lead-212	0.577		0.103	0.119		0.0460	pCi/g	09/18/18 09:24	10/09/18 17:45	1
Lead-214	0.721		0.160	0.176		0.0620	pCi/g	09/18/18 09:24	10/09/18 17:45	1
Potassium-40	12.8		1.62	2.07		0.118	pCi/g	09/18/18 09:24	10/09/18 17:45	1
Protactinium-231	-0.144	U	3.21	3.21		2.64	pCi/g	09/18/18 09:24	10/09/18 17:45	1
Radium-226	0.680		0.172	0.185	0.700	0.0546	pCi/g	09/18/18 09:24	10/09/18 17:45	1
Radium-228	0.559		0.243	0.250		0.167	pCi/g	09/18/18 09:24	10/09/18 17:45	1
Thallium-208	0.262		0.0758	0.0804		0.0257	pCi/g	09/18/18 09:24	10/09/18 17:45	1
Thorium-228	0.577		0.103	0.119		0.0460	pCi/g	09/18/18 09:24	10/09/18 17:45	1
Thorium-232	0.559		0.243	0.250		0.167	pCi/g	09/18/18 09:24	10/09/18 17:45	1
Thorium-234	1.88		0.774	0.801		0.436	pCi/g	09/18/18 09:24	10/09/18 17:45	1
Uranium-235	0.106	U	0.242	0.242		0.480	pCi/g	09/18/18 09:24	10/09/18 17:45	1
Uranium-238	1.88		0.774	0.801		0.436	pCi/g	09/18/18 09:24	10/09/18 17:45	1

Client Sample ID: PE2-RSYD11-DC-S005**Lab Sample ID: 160-30732-5**

Date Collected: 09/11/18 13:10

Matrix: Solid

Date Received: 09/14/18 08:45

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Actinium 228	1.07		0.226	0.250		0.0311	pCi/g	09/18/18 09:24	10/09/18 12:04	1
Actinium-227	0.298	U	0.571	0.572		0.372	pCi/g	09/18/18 09:24	10/09/18 12:04	1
Bismuth-212	-0.00726	U	0.964	0.964		0.794	pCi/g	09/18/18 09:24	10/09/18 12:04	1
Lead-214	0.806		0.170	0.189		0.0496	pCi/g	09/18/18 09:24	10/09/18 12:04	1
Cesium-137	0.0408	U	0.0734	0.0735	0.0700	0.0571	pCi/g	09/18/18 09:24	10/09/18 12:04	1
Cobalt-60	0.0233	U	0.0502	0.0503	0.200	0.0285	pCi/g	09/18/18 09:24	10/09/18 12:04	1
Lead-210	-0.805	U	2.14	2.15		1.79	pCi/g	09/18/18 09:24	10/09/18 12:04	1
Lead-212	0.791		0.120	0.145		0.0510	pCi/g	09/18/18 09:24	10/09/18 12:04	1
Lead-214	0.767		0.162	0.180		0.0661	pCi/g	09/18/18 09:24	10/09/18 12:04	1
Potassium-40	16.3		1.84	2.47		0.121	pCi/g	09/18/18 09:24	10/09/18 12:04	1
Protactinium-231	-0.501	U	3.42	3.42		2.80	pCi/g	09/18/18 09:24	10/09/18 12:04	1
Radium-226	0.806		0.170	0.189	0.700	0.0496	pCi/g	09/18/18 09:24	10/09/18 12:04	1
Radium-228	1.07		0.226	0.250		0.0311	pCi/g	09/18/18 09:24	10/09/18 12:04	1
Thallium-208	0.304		0.0978	0.103		0.0345	pCi/g	09/18/18 09:24	10/09/18 12:04	1
Thorium-228	0.791		0.120	0.145		0.0510	pCi/g	09/18/18 09:24	10/09/18 12:04	1
Thorium-232	1.07		0.226	0.250		0.0311	pCi/g	09/18/18 09:24	10/09/18 12:04	1
Thorium-234	0.169	U	0.423	0.424		1.03	pCi/g	09/18/18 09:24	10/09/18 12:04	1
Uranium-235	0.0298	U	0.281	0.281		0.522	pCi/g	09/18/18 09:24	10/09/18 12:04	1
Uranium-238	0.169	U	0.423	0.424		1.03	pCi/g	09/18/18 09:24	10/09/18 12:04	1

Client Sample Results

Client: Aptim Federal Services LLC

Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-30732-2

Client Sample ID: PE2-RSYD11-DC-S006**Lab Sample ID: 160-30732-6**

Date Collected: 09/11/18 13:17

Matrix: Solid

Date Received: 09/14/18 08:45

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.491		0.150	0.158		0.0417	pCi/g	09/18/18 09:24	10/09/18 12:59	1
Actinium-227	0.119	U	0.407	0.407		0.326	pCi/g	09/18/18 09:24	10/09/18 12:59	1
Bismuth-212	-0.426	U	1.04	1.04		0.818	pCi/g	09/18/18 09:24	10/09/18 12:59	1
Bismuth-214	0.706		0.172	0.187		0.0536	pCi/g	09/18/18 09:24	10/09/18 12:59	1
Cesium-137	-0.0224	U	0.107	0.107	0.0700	0.0368	pCi/g	09/18/18 09:24	10/09/18 12:59	1
Cobalt-60	-0.00238	U	0.107	0.107	0.200	0.0560	pCi/g	09/18/18 09:24	10/09/18 12:59	1
Lead-210	1.14		1.05	1.06		0.650	pCi/g	09/18/18 09:24	10/09/18 12:59	1
Lead-212	0.407		0.0958	0.109		0.0431	pCi/g	09/18/18 09:24	10/09/18 12:59	1
Lead-214	0.642		0.146	0.161		0.0885	pCi/g	09/18/18 09:24	10/09/18 12:59	1
Potassium-40	3.87		1.35	1.41		0.488	pCi/g	09/18/18 09:24	10/09/18 12:59	1
Protactinium-231	0.119	U	1.42	1.42		2.37	pCi/g	09/18/18 09:24	10/09/18 12:59	1
Radium-226	0.706		0.172	0.187	0.700	0.0536	pCi/g	09/18/18 09:24	10/09/18 12:59	1
Radium-228	0.491		0.150	0.158		0.0417	pCi/g	09/18/18 09:24	10/09/18 12:59	1
Thallium-208	0.177		0.0636	0.0662		0.0202	pCi/g	09/18/18 09:24	10/09/18 12:59	1
Thorium-228	0.407		0.0958	0.109		0.0431	pCi/g	09/18/18 09:24	10/09/18 12:59	1
Thorium-232	0.491		0.150	0.158		0.0417	pCi/g	09/18/18 09:24	10/09/18 12:59	1
Thorium-234	0.751		0.522	0.529		0.411	pCi/g	09/18/18 09:24	10/09/18 12:59	1
Uranium-235	0.0920	U	0.318	0.318		0.283	pCi/g	09/18/18 09:24	10/09/18 12:59	1
Uranium-238	0.751		0.522	0.529		0.411	pCi/g	09/18/18 09:24	10/09/18 12:59	1

Client Sample ID: PE2-RSYD11-DC-S007**Lab Sample ID: 160-30732-7**

Date Collected: 09/11/18 13:24

Matrix: Solid

Date Received: 09/14/18 08:45

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.437		0.131	0.139		0.0341	pCi/g	09/18/18 09:24	10/09/18 13:00	1
Actinium-227	0.208	U	0.417	0.418		0.302	pCi/g	09/18/18 09:24	10/09/18 13:00	1
Bismuth-212	-0.595	U	1.03	1.03		0.804	pCi/g	09/18/18 09:24	10/09/18 13:00	1
Bismuth-214	0.493		0.147	0.156		0.0576	pCi/g	09/18/18 09:24	10/09/18 13:00	1
Cesium-137	-0.0797	U	0.134	0.134	0.0700	0.0711	pCi/g	09/18/18 09:24	10/09/18 13:00	1
Cobalt-60	-0.00417	U	0.0108	0.0109	0.200	0.0548	pCi/g	09/18/18 09:24	10/09/18 13:00	1
Lead-210	-0.369	U	1.81	1.81		1.48	pCi/g	09/18/18 09:24	10/09/18 13:00	1
Lead-212	0.349		0.0900	0.101		0.0483	pCi/g	09/18/18 09:24	10/09/18 13:00	1
Lead-214	0.636		0.111	0.129		0.0494	pCi/g	09/18/18 09:24	10/09/18 13:00	1
Potassium-40	5.73		1.21	1.34		0.241	pCi/g	09/18/18 09:24	10/09/18 13:00	1
Protactinium-231	0.231	U	1.44	1.44		2.24	pCi/g	09/18/18 09:24	10/09/18 13:00	1
Radium-226	0.493		0.147	0.156	0.700	0.0576	pCi/g	09/18/18 09:24	10/09/18 13:00	1
Radium-228	0.437		0.131	0.139		0.0341	pCi/g	09/18/18 09:24	10/09/18 13:00	1
Thallium-208	0.173		0.0520	0.0550		0.0137	pCi/g	09/18/18 09:24	10/09/18 13:00	1
Thorium-228	0.349		0.0900	0.101		0.0483	pCi/g	09/18/18 09:24	10/09/18 13:00	1
Thorium-232	0.437		0.131	0.139		0.0341	pCi/g	09/18/18 09:24	10/09/18 13:00	1
Thorium-234	0.928		0.600	0.609		0.430	pCi/g	09/18/18 09:24	10/09/18 13:00	1
Uranium-235	-0.0504	U	0.382	0.382		0.418	pCi/g	09/18/18 09:24	10/09/18 13:00	1
Uranium-238	0.928		0.600	0.609		0.430	pCi/g	09/18/18 09:24	10/09/18 13:00	1

Client Sample Results

Client: Aptim Federal Services LLC

Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-30732-2

Client Sample ID: PE2-RSYD11-DC-S008**Lab Sample ID: 160-30732-8**

Date Collected: 09/11/18 13:31

Matrix: Solid

Date Received: 09/14/18 08:45

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.538		0.144	0.154		0.0229	pCi/g	09/18/18 09:24	10/09/18 12:59	1
Actinium-227	0.101	U	0.215	0.215		0.294	pCi/g	09/18/18 09:24	10/09/18 12:59	1
Bismuth-212	0.310	U	0.961	0.961		0.773	pCi/g	09/18/18 09:24	10/09/18 12:59	1
Bismuth-214	0.539		0.117	0.129		0.0389	pCi/g	09/18/18 09:24	10/09/18 12:59	1
Cesium-137	0.0117	U	0.0534	0.0534	0.0700	0.0430	pCi/g	09/18/18 09:24	10/09/18 12:59	1
Cobalt-60	0.0118	U	0.0321	0.0321	0.200	0.0213	pCi/g	09/18/18 09:24	10/09/18 12:59	1
Lead-210	0.356	U	1.22	1.23		0.991	pCi/g	09/18/18 09:24	10/09/18 12:59	1
Lead-212	0.419		0.0737	0.0915		0.0284	pCi/g	09/18/18 09:24	10/09/18 12:59	1
Lead-214	0.579		0.0991	0.116		0.0404	pCi/g	09/18/18 09:24	10/09/18 12:59	1
Potassium-40	7.00		1.08	1.30		0.231	pCi/g	09/18/18 09:24	10/09/18 12:59	1
Protactinium-231	-0.690	U	2.47	2.48		2.02	pCi/g	09/18/18 09:24	10/09/18 12:59	1
Radium-226	0.539		0.117	0.129	0.700	0.0389	pCi/g	09/18/18 09:24	10/09/18 12:59	1
Radium-228	0.538		0.144	0.154		0.0229	pCi/g	09/18/18 09:24	10/09/18 12:59	1
Thallium-208	0.137		0.0473	0.0494		0.0158	pCi/g	09/18/18 09:24	10/09/18 12:59	1
Thorium-228	0.419		0.0737	0.0915		0.0284	pCi/g	09/18/18 09:24	10/09/18 12:59	1
Thorium-232	0.538		0.144	0.154		0.0229	pCi/g	09/18/18 09:24	10/09/18 12:59	1
Thorium-234	0.608		0.374	0.380		0.286	pCi/g	09/18/18 09:24	10/09/18 12:59	1
Uranium-235	-0.0434	U	0.0779	0.0781		0.399	pCi/g	09/18/18 09:24	10/09/18 12:59	1
Uranium-238	0.608		0.374	0.380		0.286	pCi/g	09/18/18 09:24	10/09/18 12:59	1

Client Sample ID: PE2-RSYD11-DC-S009**Lab Sample ID: 160-30732-9**

Date Collected: 09/11/18 13:38

Matrix: Solid

Date Received: 09/14/18 08:45

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.966		0.190	0.214		0.0626	pCi/g	09/18/18 09:24	10/09/18 13:00	1
Actinium-227	0.115	U	0.411	0.412		0.462	pCi/g	09/18/18 09:24	10/09/18 13:00	1
Bismuth-212	-0.336	U	1.11	1.11		0.888	pCi/g	09/18/18 09:24	10/09/18 13:00	1
Bismuth-214	0.597		0.168	0.178		0.0615	pCi/g	09/18/18 09:24	10/09/18 13:00	1
Cesium-137	-0.00323	U	0.0754	0.0754	0.0700	0.0428	pCi/g	09/18/18 09:24	10/09/18 13:00	1
Cobalt-60	0.00229	U	0.00229	0.00230	0.200	0.0613	pCi/g	09/18/18 09:24	10/09/18 13:00	1
Lead-210	0.937	U	2.11	2.11		1.69	pCi/g	09/18/18 09:24	10/09/18 13:00	1
Lead-212	0.548		0.119	0.132		0.0652	pCi/g	09/18/18 09:24	10/09/18 13:00	1
Lead-214	0.657		0.132	0.148		0.0525	pCi/g	09/18/18 09:24	10/09/18 13:00	1
Potassium-40	13.6		1.74	2.22		0.130	pCi/g	09/18/18 09:24	10/09/18 13:00	1
Protactinium-231	0.000	U	1.11	1.11		2.80	pCi/g	09/18/18 09:24	10/09/18 13:00	1
Radium-226	0.597		0.168	0.178	0.700	0.0615	pCi/g	09/18/18 09:24	10/09/18 13:00	1
Radium-228	0.966		0.190	0.214		0.0626	pCi/g	09/18/18 09:24	10/09/18 13:00	1
Thallium-208	0.227		0.0808	0.0841		0.0299	pCi/g	09/18/18 09:24	10/09/18 13:00	1
Thorium-228	0.548		0.119	0.132		0.0652	pCi/g	09/18/18 09:24	10/09/18 13:00	1
Thorium-232	0.966		0.190	0.214		0.0626	pCi/g	09/18/18 09:24	10/09/18 13:00	1
Thorium-234	0.843		0.687	0.693		0.514	pCi/g	09/18/18 09:24	10/09/18 13:00	1
Uranium-235	0.000	U	0.223	0.223		0.602	pCi/g	09/18/18 09:24	10/09/18 13:00	1
Uranium-238	0.843		0.687	0.693		0.514	pCi/g	09/18/18 09:24	10/09/18 13:00	1

Client Sample Results

Client: Aptim Federal Services LLC

Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-30732-2

Client Sample ID: PE2-RSYD11-DC-S010**Lab Sample ID: 160-30732-10**

Date Collected: 09/11/18 13:45

Matrix: Solid

Date Received: 09/14/18 08:45

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.594		0.182	0.192		0.0620	pCi/g	09/18/18 09:24	10/09/18 12:58	1
Actinium-227	0.340	U	0.230	0.234		0.382	pCi/g	09/18/18 09:24	10/09/18 12:58	1
Bismuth-212	0.519	U	1.16	1.16		0.923	pCi/g	09/18/18 09:24	10/09/18 12:58	1
Bismuth-214	0.515		0.137	0.147		0.0478	pCi/g	09/18/18 09:24	10/09/18 12:58	1
Cesium-137	-0.0479	U	0.0802	0.0804	0.0700	0.0630	pCi/g	09/18/18 09:24	10/09/18 12:58	1
Cobalt-60	-0.000101	U	0.000342	0.000342	0.200	0.0310	pCi/g	09/18/18 09:24	10/09/18 12:58	1
Lead-210	0.688	U	1.45	1.45		0.998	pCi/g	09/18/18 09:24	10/09/18 12:58	1
Lead-212	0.446		0.102	0.117		0.0558	pCi/g	09/18/18 09:24	10/09/18 12:58	1
Lead-214	0.531		0.140	0.150		0.0662	pCi/g	09/18/18 09:24	10/09/18 12:58	1
Potassium-40	7.97		1.37	1.59		0.254	pCi/g	09/18/18 09:24	10/09/18 12:58	1
Protactinium-231	0.580	U	1.82	1.83		2.00	pCi/g	09/18/18 09:24	10/09/18 12:58	1
Radium-226	0.515		0.137	0.147	0.700	0.0478	pCi/g	09/18/18 09:24	10/09/18 12:58	1
Radium-228	0.594		0.182	0.192		0.0620	pCi/g	09/18/18 09:24	10/09/18 12:58	1
Thallium-208	0.192		0.0584	0.0617		0.0195	pCi/g	09/18/18 09:24	10/09/18 12:58	1
Thorium-228	0.446		0.102	0.117		0.0558	pCi/g	09/18/18 09:24	10/09/18 12:58	1
Thorium-232	0.594		0.182	0.192		0.0620	pCi/g	09/18/18 09:24	10/09/18 12:58	1
Thorium-234	0.833		0.515	0.523		0.387	pCi/g	09/18/18 09:24	10/09/18 12:58	1
Uranium-235	0.000	U	0.180	0.180		0.302	pCi/g	09/18/18 09:24	10/09/18 12:58	1
Uranium-238	0.833		0.515	0.523		0.387	pCi/g	09/18/18 09:24	10/09/18 12:58	1

Client Sample ID: PE2-RSYD11-DC-S011**Lab Sample ID: 160-30732-11**

Date Collected: 09/11/18 13:52

Matrix: Solid

Date Received: 09/14/18 08:45

Method: 905.0 - Total Beta Strontium (GFPC)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Total Beta Strontium	0.234		0.0802	0.0819	0.331	0.0468	pCi/g	09/18/18 18:36	10/08/18 04:45	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Sr Carrier	82.7		40 - 110					09/18/18 18:36	10/08/18 04:45	1

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.451		0.168	0.174		0.168	pCi/g	09/18/18 09:24	10/09/18 12:59	1
Actinium-227	0.144	U	0.329	0.330		0.386	pCi/g	09/18/18 09:24	10/09/18 12:59	1
Bismuth-212	0.00594	U	0.828	0.828		0.681	pCi/g	09/18/18 09:24	10/09/18 12:59	1
Bismuth-214	0.551		0.146	0.157		0.0501	pCi/g	09/18/18 09:24	10/09/18 12:59	1
Cesium-137	0.0214	U	0.0488	0.0489	0.0700	0.0371	pCi/g	09/18/18 09:24	10/09/18 12:59	1
Cobalt-60	0.0101	U	0.0525	0.0525	0.200	0.0358	pCi/g	09/18/18 09:24	10/09/18 12:59	1
Lead-210	-0.256	U	1.60	1.60		1.33	pCi/g	09/18/18 09:24	10/09/18 12:59	1
Lead-212	0.356		0.0994	0.110		0.0556	pCi/g	09/18/18 09:24	10/09/18 12:59	1
Lead-214	0.546		0.132	0.143		0.0641	pCi/g	09/18/18 09:24	10/09/18 12:59	1
Potassium-40	7.62		1.42	1.62		0.155	pCi/g	09/18/18 09:24	10/09/18 12:59	1
Protactinium-231	0.362	U	1.50	1.50		2.34	pCi/g	09/18/18 09:24	10/09/18 12:59	1

Client Sample Results

Client: Aptim Federal Services LLC

Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-30732-2

Client Sample ID: PE2-RSYD11-DC-S011**Lab Sample ID: 160-30732-11**

Date Collected: 09/11/18 13:52

Matrix: Solid

Date Received: 09/14/18 08:45

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS) (Continued)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Radium-226	0.551		0.146	0.157	0.700	0.0501	pCi/g	09/18/18 09:24	10/09/18 12:59	1
Radium-228	0.451		0.168	0.174		0.168	pCi/g	09/18/18 09:24	10/09/18 12:59	1
Thallium-208	0.123		0.0620	0.0633		0.0278	pCi/g	09/18/18 09:24	10/09/18 12:59	1
Thorium-228	0.356		0.0994	0.110		0.0556	pCi/g	09/18/18 09:24	10/09/18 12:59	1
Thorium-232	0.451		0.168	0.174		0.168	pCi/g	09/18/18 09:24	10/09/18 12:59	1
Thorium-234	-0.859	U		0.857	0.862	1.20	pCi/g	09/18/18 09:24	10/09/18 12:59	1
Uranium-235	-0.182	U		0.535	0.535	0.435	pCi/g	09/18/18 09:24	10/09/18 12:59	1
Uranium-238	-0.859	U		0.857	0.862	1.20	pCi/g	09/18/18 09:24	10/09/18 12:59	1

Client Sample ID: PE2-RSYD11-DC-S012**Lab Sample ID: 160-30732-12**

Date Collected: 09/11/18 13:59

Matrix: Solid

Date Received: 09/14/18 08:45

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac	
			(2σ+/-)	(2σ+/-)							
Actinium 228	0.456		0.195	0.200		0.0805	pCi/g	09/18/18 09:24	10/09/18 13:01	1	
Actinium-227	0.0477	U		0.189	0.189	0.374	pCi/g	09/18/18 09:24	10/09/18 13:01	1	
Bismuth-212	-0.415	U		0.810	0.811	0.634	pCi/g	09/18/18 09:24	10/09/18 13:01	1	
Bismuth-214	0.586		0.132	0.146		0.0452	pCi/g	09/18/18 09:24	10/09/18 13:01	1	
Cesium-137	0.0291	U		0.0635	0.0636	0.0700	0.0499	pCi/g	09/18/18 09:24	10/09/18 13:01	1
Cobalt-60	-0.0139	U		0.0896	0.0896	0.200	0.0429	pCi/g	09/18/18 09:24	10/09/18 13:01	1
Lead-210	0.795	U		1.36	1.37	0.915	pCi/g	09/18/18 09:24	10/09/18 13:01	1	
Lead-212	0.431		0.0926	0.108		0.0476	pCi/g	09/18/18 09:24	10/09/18 13:01	1	
Lead-214	0.489		0.131	0.140		0.0561	pCi/g	09/18/18 09:24	10/09/18 13:01	1	
Potassium-40	7.01			1.19	1.39	0.279	pCi/g	09/18/18 09:24	10/09/18 13:01	1	
Protactinium-231	0.595	U		1.91	1.91	1.54	pCi/g	09/18/18 09:24	10/09/18 13:01	1	
Radium-226	0.586		0.132	0.146	0.700	0.0452	pCi/g	09/18/18 09:24	10/09/18 13:01	1	
Radium-228	0.456		0.195	0.200		0.0805	pCi/g	09/18/18 09:24	10/09/18 13:01	1	
Thallium-208	0.141		0.0556	0.0575		0.0261	pCi/g	09/18/18 09:24	10/09/18 13:01	1	
Thorium-228	0.431		0.0926	0.108		0.0476	pCi/g	09/18/18 09:24	10/09/18 13:01	1	
Thorium-232	0.456		0.195	0.200		0.0805	pCi/g	09/18/18 09:24	10/09/18 13:01	1	
Thorium-234	0.598		0.614	0.618		0.415	pCi/g	09/18/18 09:24	10/09/18 13:01	1	
Uranium-235	0.135	U		0.344	0.345	0.293	pCi/g	09/18/18 09:24	10/09/18 13:01	1	
Uranium-238	0.598		0.614	0.618		0.415	pCi/g	09/18/18 09:24	10/09/18 13:01	1	

Client Sample ID: PE2-RSYD11-DC-S013**Lab Sample ID: 160-30732-13**

Date Collected: 09/11/18 14:08

Matrix: Solid

Date Received: 09/14/18 08:45

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.910		0.222	0.240		0.0777	pCi/g	09/18/18 09:24	10/09/18 14:19	1
Actinium-227	0.114	U		0.230	0.231	0.476	pCi/g	09/18/18 09:24	10/09/18 14:19	1
Bismuth-212	0.674	U		1.29	1.29	1.01	pCi/g	09/18/18 09:24	10/09/18 14:19	1

Client Sample Results

Client: Aptim Federal Services LLC

Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-30732-2

Client Sample ID: PE2-RSYD11-DC-S013**Lab Sample ID: 160-30732-13**

Date Collected: 09/11/18 14:08

Matrix: Solid

Date Received: 09/14/18 08:45

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS) (Continued)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Bismuth-214	0.841		0.167	0.188		0.0398	pCi/g	09/18/18 09:24	10/09/18 14:19	1
Cesium-137	-0.0337	U	0.0976	0.0977	0.0700	0.0725	pCi/g	09/18/18 09:24	10/09/18 14:19	1
Cobalt-60	0.0132	U	0.0605	0.0605	0.200	0.0145	pCi/g	09/18/18 09:24	10/09/18 14:19	1
Lead-210	-0.794	U	2.53	2.54		2.11	pCi/g	09/18/18 09:24	10/09/18 14:19	1
Lead-212	0.679		0.130	0.148		0.0656	pCi/g	09/18/18 09:24	10/09/18 14:19	1
Lead-214	0.787		0.187	0.203		0.0797	pCi/g	09/18/18 09:24	10/09/18 14:19	1
Potassium-40	15.3		2.02	2.55		0.397	pCi/g	09/18/18 09:24	10/09/18 14:19	1
Protactinium-231	-1.26	U	4.23	4.23		3.45	pCi/g	09/18/18 09:24	10/09/18 14:19	1
Radium-226	0.841		0.167	0.188	0.700	0.0398	pCi/g	09/18/18 09:24	10/09/18 14:19	1
Radium-228	0.910		0.222	0.240		0.0777	pCi/g	09/18/18 09:24	10/09/18 14:19	1
Thallium-208	0.260		0.0873	0.0912		0.0313	pCi/g	09/18/18 09:24	10/09/18 14:19	1
Thorium-228	0.679		0.130	0.148		0.0656	pCi/g	09/18/18 09:24	10/09/18 14:19	1
Thorium-232	0.910		0.222	0.240		0.0777	pCi/g	09/18/18 09:24	10/09/18 14:19	1
Thorium-234	0.0381	U	0.725	0.725		0.591	pCi/g	09/18/18 09:24	10/09/18 14:19	1
Uranium-235	-0.284	U	0.449	0.450		0.618	pCi/g	09/18/18 09:24	10/09/18 14:19	1
Uranium-238	0.0381	U	0.725	0.725		0.591	pCi/g	09/18/18 09:24	10/09/18 14:19	1

Client Sample ID: PE2-RSYD11-DC-S014**Lab Sample ID: 160-30732-14**

Date Collected: 09/11/18 14:17

Matrix: Solid

Date Received: 09/14/18 08:45

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.790		0.246	0.259		0.0440	pCi/g	09/18/18 09:24	10/09/18 13:36	1
Actinium-227	0.0931	U	0.283	0.283		0.501	pCi/g	09/18/18 09:24	10/09/18 13:36	1
Bismuth-212	1.02		0.496	0.507		0.140	pCi/g	09/18/18 09:24	10/09/18 13:36	1
Bismuth-214	0.743		0.183	0.199		0.0543	pCi/g	09/18/18 09:24	10/09/18 13:36	1
Cesium-137	0.00357	U	0.107	0.107	0.0700	0.0876	pCi/g	09/18/18 09:24	10/09/18 13:36	1
Cobalt-60	-0.00503	U	0.161	0.161	0.200	0.0718	pCi/g	09/18/18 09:24	10/09/18 13:36	1
Lead-210	-0.0412	U	1.50	1.50		1.06	pCi/g	09/18/18 09:24	10/09/18 13:36	1
Lead-212	0.559		0.119	0.139		0.0572	pCi/g	09/18/18 09:24	10/09/18 13:36	1
Lead-214	0.563		0.141	0.153		0.0711	pCi/g	09/18/18 09:24	10/09/18 13:36	1
Potassium-40	13.8		2.09	2.53		0.311	pCi/g	09/18/18 09:24	10/09/18 13:36	1
Protactinium-231	-0.0000000	U	3.18	3.18		2.62	pCi/g	09/18/18 09:24	10/09/18 13:36	1
	362									
Radium-226	0.743		0.183	0.199	0.700	0.0543	pCi/g	09/18/18 09:24	10/09/18 13:36	1
Radium-228	0.790		0.246	0.259		0.0440	pCi/g	09/18/18 09:24	10/09/18 13:36	1
Thallium-208	0.255		0.0700	0.0748		0.0114	pCi/g	09/18/18 09:24	10/09/18 13:36	1
Thorium-228	0.559		0.119	0.139		0.0572	pCi/g	09/18/18 09:24	10/09/18 13:36	1
Thorium-232	0.790		0.246	0.259		0.0440	pCi/g	09/18/18 09:24	10/09/18 13:36	1
Thorium-234	0.0708	U	0.721	0.721		0.588	pCi/g	09/18/18 09:24	10/09/18 13:36	1
Uranium-235	-0.227	U	0.391	0.391		0.351	pCi/g	09/18/18 09:24	10/09/18 13:36	1
Uranium-238	0.0708	U	0.721	0.721		0.588	pCi/g	09/18/18 09:24	10/09/18 13:36	1

Client Sample Results

Client: Aptim Federal Services LLC

Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-30732-2

Client Sample ID: PE2-RSYD11-DC-S015**Lab Sample ID: 160-30732-15**

Date Collected: 09/11/18 12:36

Matrix: Solid

Date Received: 09/14/18 08:45

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Actinium 228	1.10		0.257	0.281		0.0409	pCi/g	09/18/18 09:24	10/09/18 13:40	1
Actinium-227	0.374 U		0.827	0.828		0.468	pCi/g	09/18/18 09:24	10/09/18 13:40	1
Bismuth-212	-0.520 U		1.58	1.58		1.27	pCi/g	09/18/18 09:24	10/09/18 13:40	1
Bismuth-214	1.21		0.239	0.270		0.0762	pCi/g	09/18/18 09:24	10/09/18 13:40	1
Cesium-137	-0.0956 U		0.205	0.206	0.0700	0.0870	pCi/g	09/18/18 09:24	10/09/18 13:40	1
Cobalt-60	-0.102 U		0.174	0.174	0.200	0.0849	pCi/g	09/18/18 09:24	10/09/18 13:40	1
Lead-210	-1.28 U		2.76	2.77		2.24	pCi/g	09/18/18 09:24	10/09/18 13:40	1
Lead-212	1.00		0.146	0.195		0.0597	pCi/g	09/18/18 09:24	10/09/18 13:40	1
Lead-214	1.36		0.226	0.266		0.0742	pCi/g	09/18/18 09:24	10/09/18 13:40	1
Potassium-40	13.4		1.99	2.42		0.289	pCi/g	09/18/18 09:24	10/09/18 13:40	1
Protactinium-231	0.000 U		1.17	1.17		3.44	pCi/g	09/18/18 09:24	10/09/18 13:40	1
Radium-226	1.21		0.239	0.270	0.700	0.0762	pCi/g	09/18/18 09:24	10/09/18 13:40	1
Radium-228	1.10		0.257	0.281		0.0409	pCi/g	09/18/18 09:24	10/09/18 13:40	1
Thallium-208	0.296		0.0795	0.0852		0.0242	pCi/g	09/18/18 09:24	10/09/18 13:40	1
Thorium-228	1.00		0.146	0.195		0.0597	pCi/g	09/18/18 09:24	10/09/18 13:40	1
Thorium-232	1.10		0.257	0.281		0.0409	pCi/g	09/18/18 09:24	10/09/18 13:40	1
Thorium-234	0.948		0.884	0.890		0.687	pCi/g	09/18/18 09:24	10/09/18 13:40	1
Uranium-235	-0.343 U		0.478	0.479		0.626	pCi/g	09/18/18 09:24	10/09/18 13:40	1
Uranium-238	0.948		0.884	0.890		0.687	pCi/g	09/18/18 09:24	10/09/18 13:40	1

Client Sample ID: PE2-RSYD11-DC-S016**Lab Sample ID: 160-30732-16**

Date Collected: 09/11/18 14:25

Matrix: Solid

Date Received: 09/14/18 08:45

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.434		0.127	0.135		0.0228	pCi/g	09/18/18 09:24	10/09/18 13:36	1
Actinium-227	0.166 U		0.354	0.354		0.202	pCi/g	09/18/18 09:24	10/09/18 13:36	1
Bismuth-212	-0.0768 U		0.725	0.725		0.601	pCi/g	09/18/18 09:24	10/09/18 13:36	1
Bismuth-214	0.489		0.108	0.119		0.0340	pCi/g	09/18/18 09:24	10/09/18 13:36	1
Cesium-137	0.0192 U		0.0492	0.0493	0.0700	0.0388	pCi/g	09/18/18 09:24	10/09/18 13:36	1
Cobalt-60	-0.0547 U		0.0905	0.0907	0.200	0.0426	pCi/g	09/18/18 09:24	10/09/18 13:36	1
Lead-210	-0.711 U		1.57	1.57		1.26	pCi/g	09/18/18 09:24	10/09/18 13:36	1
Lead-212	0.387		0.0800	0.0944		0.0410	pCi/g	09/18/18 09:24	10/09/18 13:36	1
Lead-214	0.527		0.0981	0.112		0.0351	pCi/g	09/18/18 09:24	10/09/18 13:36	1
Potassium-40	7.92		1.14	1.40		0.230	pCi/g	09/18/18 09:24	10/09/18 13:36	1
Protactinium-231	0.000 U		0.466	0.466		1.83	pCi/g	09/18/18 09:24	10/09/18 13:36	1
Radium-226	0.489		0.108	0.119	0.700	0.0340	pCi/g	09/18/18 09:24	10/09/18 13:36	1
Radium-228	0.434		0.127	0.135		0.0228	pCi/g	09/18/18 09:24	10/09/18 13:36	1
Thallium-208	0.126		0.0408	0.0428		0.0129	pCi/g	09/18/18 09:24	10/09/18 13:36	1
Thorium-228	0.387		0.0800	0.0944		0.0410	pCi/g	09/18/18 09:24	10/09/18 13:36	1
Thorium-232	0.434		0.127	0.135		0.0228	pCi/g	09/18/18 09:24	10/09/18 13:36	1
Thorium-234	0.236 U		0.738	0.739		0.601	pCi/g	09/18/18 09:24	10/09/18 13:36	1
Uranium-235	0.144 U		0.403	0.403		0.328	pCi/g	09/18/18 09:24	10/09/18 13:36	1
Uranium-238	0.236 U		0.738	0.739		0.601	pCi/g	09/18/18 09:24	10/09/18 13:36	1

Client Sample Results

Client: Aptim Federal Services LLC

Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-30732-2

Client Sample ID: PE2-RSYD11-DC-S017**Lab Sample ID: 160-30732-17**

Date Collected: 09/11/18 14:32

Matrix: Solid

Date Received: 09/14/18 08:45

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.951		0.210	0.231		0.0298	pCi/g	09/18/18 09:24	10/09/18 13:40	1
Actinium-227	0.0532	U	0.229	0.229		0.450	pCi/g	09/18/18 09:24	10/09/18 13:40	1
Bismuth-212	0.538	U	1.04	1.04		0.818	pCi/g	09/18/18 09:24	10/09/18 13:40	1
Bismuth-214	0.669		0.136	0.152		0.0268	pCi/g	09/18/18 09:24	10/09/18 13:40	1
Cesium-137	-0.0524	U	0.0845	0.0846	0.0700	0.0660	pCi/g	09/18/18 09:24	10/09/18 13:40	1
Cobalt-60	0.0230	U	0.0805	0.0805	0.200	0.0386	pCi/g	09/18/18 09:24	10/09/18 13:40	1
Lead-210	-0.736	U	2.35	2.35		1.96	pCi/g	09/18/18 09:24	10/09/18 13:40	1
Lead-212	0.778		0.115	0.141		0.0474	pCi/g	09/18/18 09:24	10/09/18 13:40	1
Lead-214	0.776		0.162	0.180		0.0605	pCi/g	09/18/18 09:24	10/09/18 13:40	1
Potassium-40	18.5		1.92	2.68		0.115	pCi/g	09/18/18 09:24	10/09/18 13:40	1
Protactinium-231	0.000	U	0.660	0.660		2.66	pCi/g	09/18/18 09:24	10/09/18 13:40	1
Radium-226	0.669		0.136	0.152	0.700	0.0268	pCi/g	09/18/18 09:24	10/09/18 13:40	1
Radium-228	0.951		0.210	0.231		0.0298	pCi/g	09/18/18 09:24	10/09/18 13:40	1
Thallium-208	0.347		0.0737	0.0817		0.0160	pCi/g	09/18/18 09:24	10/09/18 13:40	1
Thorium-228	0.778		0.115	0.141		0.0474	pCi/g	09/18/18 09:24	10/09/18 13:40	1
Thorium-232	0.951		0.210	0.231		0.0298	pCi/g	09/18/18 09:24	10/09/18 13:40	1
Thorium-234	0.641		0.633	0.637		0.487	pCi/g	09/18/18 09:24	10/09/18 13:40	1
Uranium-235	0.146	U	0.546	0.546		0.510	pCi/g	09/18/18 09:24	10/09/18 13:40	1
Uranium-238	0.641		0.633	0.637		0.487	pCi/g	09/18/18 09:24	10/09/18 13:40	1

Client Sample ID: PE2-RSYD11-DC-S018**Lab Sample ID: 160-30732-18**

Date Collected: 09/11/18 12:30

Matrix: Solid

Date Received: 09/14/18 08:45

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.925		0.301	0.315		0.0837	pCi/g	09/18/18 09:24	10/09/18 13:39	1
Actinium-227	-0.399	U	1.22	1.22		0.670	pCi/g	09/18/18 09:24	10/09/18 13:39	1
Bismuth-212	0.000	U	0.687	0.687		0.675	pCi/g	09/18/18 09:24	10/09/18 13:39	1
Bismuth-214	1.07		0.177	0.209		0.0392	pCi/g	09/18/18 09:24	10/09/18 13:39	1
Cesium-137	-0.0635	U	0.103	0.103	0.0700	0.0853	pCi/g	09/18/18 09:24	10/09/18 13:39	1
Cobalt-60	0.0157	U	0.0340	0.0340	0.200	0.0459	pCi/g	09/18/18 09:24	10/09/18 13:39	1
Lead-210	1.54		1.74	1.75		1.17	pCi/g	09/18/18 09:24	10/09/18 13:39	1
Lead-212	0.461		0.109	0.124		0.0607	pCi/g	09/18/18 09:24	10/09/18 13:39	1
Lead-214	1.01		0.163	0.194		0.0737	pCi/g	09/18/18 09:24	10/09/18 13:39	1
Potassium-40	9.01		1.50	1.76		0.272	pCi/g	09/18/18 09:24	10/09/18 13:39	1
Protactinium-231	0.000	U	0.352	0.352		2.63	pCi/g	09/18/18 09:24	10/09/18 13:39	1
Radium-226	1.07		0.177	0.209	0.700	0.0392	pCi/g	09/18/18 09:24	10/09/18 13:39	1
Radium-228	0.925		0.301	0.315		0.0837	pCi/g	09/18/18 09:24	10/09/18 13:39	1
Thallium-208	0.254		0.0808	0.0850		0.0332	pCi/g	09/18/18 09:24	10/09/18 13:39	1
Thorium-228	0.461		0.109	0.124		0.0607	pCi/g	09/18/18 09:24	10/09/18 13:39	1
Thorium-232	0.925		0.301	0.315		0.0837	pCi/g	09/18/18 09:24	10/09/18 13:39	1
Thorium-234	0.277	U	0.563	0.564		0.446	pCi/g	09/18/18 09:24	10/09/18 13:39	1
Uranium-235	-0.0717	U	0.449	0.449		0.367	pCi/g	09/18/18 09:24	10/09/18 13:39	1
Uranium-238	0.277	U	0.563	0.564		0.446	pCi/g	09/18/18 09:24	10/09/18 13:39	1

QC Sample Results

Client: Aptim Federal Services LLC

Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-30732-2

Method: 905.0 - Total Beta Strontium (GFPC)

Lab Sample ID: MB 160-390125/10-A

Matrix: Solid

Analysis Batch: 393579

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 390125

Analyte	Result	MB MB	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
Total Beta Strontium	0.1158		0.0866	0.0869	0.331	0.0620	pCi/g	09/18/18 18:36	10/08/18 04:52	1
Carrier	%Yield	MB MB	Qualifer	Limits				Prepared	Analyzed	Dil Fac
Sr Carrier	68.7			40 - 110				09/18/18 18:36	10/08/18 04:52	1

Lab Sample ID: LCS 160-390125/1-A

Matrix: Solid

Analysis Batch: 393580

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 390125

Analyte		Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	LOQ	DLC	Unit	%Rec.	Limit
Total Beta Strontium		8.18	7.554		0.618	0.331	0.0517	pCi/g	92	75 - 125
Carrier		%Yield	Qualifer	Limits						
Sr Carrier		84.3		40 - 110						

Lab Sample ID: 160-30732-1 DU

Matrix: Solid

Analysis Batch: 393580

Client Sample ID: PE2-RSYD11-DC-S001

Prep Type: Total/NA

Prep Batch: 390125

Analyte	Sample Result	Sample Qual	DU Result	DU Qual	Total Uncert. (2σ+/-)	LOQ	DLC	Unit	RER	Limit
Total Beta Strontium	0.101		0.1087		0.0699	0.331	0.0485	pCi/g	0.05	1
Carrier	%Yield	Qualifer	Limits							
Sr Carrier	88.7		40 - 110							

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Lab Sample ID: MB 160-389963/1-A

Matrix: Solid

Analysis Batch: 393779

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 389963

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
Actinium 228	-0.1211	U	0.298	0.298		0.149	pCi/g	09/18/18 09:24	10/09/18 13:39	1
Actinium-227	0.04742	U	0.100	0.100		0.354	pCi/g	09/18/18 09:24	10/09/18 13:39	1
Bismuth-212	-0.01392	U	1.04	1.04		0.230	pCi/g	09/18/18 09:24	10/09/18 13:39	1
Bismuth-214	-0.007715	U	0.162	0.162		0.133	pCi/g	09/18/18 09:24	10/09/18 13:39	1
Cesium-137	-0.04644	U	0.0804	0.0806	0.0700	0.0611	pCi/g	09/18/18 09:24	10/09/18 13:39	1
Cobalt-60	-0.001723	U	0.0461	0.0461	0.200	0.0190	pCi/g	09/18/18 09:24	10/09/18 13:39	1
Lead-210	-0.5165	U	1.59	1.59		1.34	pCi/g	09/18/18 09:24	10/09/18 13:39	1
Lead-212	-0.03925	U	0.0979	0.0980		0.104	pCi/g	09/18/18 09:24	10/09/18 13:39	1
Lead-214	-0.1109	U	0.224	0.224		0.118	pCi/g	09/18/18 09:24	10/09/18 13:39	1

QC Sample Results

Client: Aptim Federal Services LLC

Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-30732-2

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS) (Continued)

Lab Sample ID: MB 160-389963/1-A

Matrix: Solid

Analysis Batch: 393779

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 389963

Analyte	Result	MB Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Potassium-40	-0.01150	U	0.483	0.483		0.193	pCi/g	09/18/18 09:24	10/09/18 13:39	1
Protactinium-231	0.4278	U	2.44	2.44		1.98	pCi/g	09/18/18 09:24	10/09/18 13:39	1
Radium-226	-0.007715	U	0.162	0.162	0.700	0.133	pCi/g	09/18/18 09:24	10/09/18 13:39	1
Radium-228	-0.1211	U	0.298	0.298		0.149	pCi/g	09/18/18 09:24	10/09/18 13:39	1
Thorium-228	-0.03925	U	0.0979	0.0980		0.104	pCi/g	09/18/18 09:24	10/09/18 13:39	1
Thorium-232	-0.1211	U	0.298	0.298		0.149	pCi/g	09/18/18 09:24	10/09/18 13:39	1
Thorium-234	0.4805		0.488	0.491		0.357	pCi/g	09/18/18 09:24	10/09/18 13:39	1
Uranium-235	-0.06410	U	0.416	0.416		0.339	pCi/g	09/18/18 09:24	10/09/18 13:39	1
Uranium-238	0.4805		0.488	0.491		0.357	pCi/g	09/18/18 09:24	10/09/18 13:39	1

Lab Sample ID: MB 160-389963/1-A

Matrix: Solid

Analysis Batch: 393779

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 389963

Analyte	Result	MB Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Thallium-208	-0.004091	U	0.0404	0.0404		0.0218	pCi/g	09/18/18 09:24	10/09/18 19:21	1

Lab Sample ID: LCS 160-389963/2-A

Matrix: Solid

Analysis Batch: 393780

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 389963

Analyte	Spike Added	LCS Result	LCS Qual	Total	LOQ	DLC	Unit	%Rec	Limits	
				Uncert. (2σ+/-)						
Americium-241	96.8	97.63		10.3		0.554	pCi/g	101	87 - 116	
Cesium-137	28.1	27.52		2.93	0.0700	0.0846	pCi/g	98	87 - 120	
Cobalt-60	12.6	12.67		1.32	0.200	0.0121	pCi/g	100	87 - 115	

Lab Sample ID: 160-30732-1 DU

Matrix: Solid

Analysis Batch: 393782

Client Sample ID: PE2-RSYD11-DC-S001

Prep Type: Total/NA

Prep Batch: 389963

Analyte	Sample Result	Sample Qual	DU Result	DU Qual	Total	LOQ	DLC	Unit	RER	Limit
					Uncert. (2σ+/-)					
Actinium 228	0.919		0.8712		0.217		0.0611	pCi/g	0.11	1
Actinium-227	-0.451	U	-0.2625	U	0.757		0.441	pCi/g	0.11	1
Bismuth-212	-0.182	U	0.08324	U	0.826		0.673	pCi/g	0.14	1
Bismuth-214	0.747		0.6192		0.164		0.0495	pCi/g	0.33	1
Cesium-137	0.0343	U	-0.00496	U	0.0886	0.0700	0.0732	pCi/g	0.22	1
Cobalt-60	0.0385		-0.00360	U	0.0147	0.200	0.0512	pCi/g	0.50	1
Lead-210	1.84		-0.3014	U	1.80		1.47	pCi/g	0.57	1
Lead-212	0.789		0.8023		0.152		0.0408	pCi/g	0.04	1
Lead-214	0.827		0.7805		0.156		0.0703	pCi/g	0.14	1
Potassium-40	19.9		16.96		2.62		0.225	pCi/g	0.52	1
Protactinium-231	0.000	U	0.0000	U	0.570		2.61	pCi/g	0	1
Radium-226	0.747		0.6192		0.164	0.700	0.0495	pCi/g	0.33	1

QC Sample Results

Client: Aptim Federal Services LLC

Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-30732-2

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS) (Continued)

Lab Sample ID: 160-30732-1 DU

Client Sample ID: PE2-RSYD11-DC-S001

Matrix: Solid

Prep Type: Total/NA

Analysis Batch: 393782

Prep Batch: 389963

Analyte	Sample	Sample	DU		DU		Total		LOQ	DLC	Unit	RER	RER Limit
	Result	Qual	Result	Qual	Uncert. (2σ+/-)								
Radium-228	0.919		0.8712		0.217		0.0611	pCi/g				0.11	1
Thallium-208	0.330		0.3892		0.0833		0.0128	pCi/g				0.36	1
Thorium-228	0.789		0.8023		0.152		0.0408	pCi/g				0.04	1
Thorium-232	0.919		0.8712		0.217		0.0611	pCi/g				0.11	1
Thorium-234	0.337	U	0.4029	U	0.570		0.477	pCi/g				0.06	1
Uranium-235	-0.0223	U	0.1557	U	0.543		0.442	pCi/g				0.19	1
Uranium-238	0.337	U	0.4029	U	0.570		0.477	pCi/g				0.06	1

QC Association Summary

Client: Aptim Federal Services LLC

Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-30732-2

Rad**Leach Batch: 389249**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-30732-1	PE2-RSYD11-DC-S001	Total/NA	Solid	Dry and Grind	
160-30732-2	PE2-RSYD11-DC-S002	Total/NA	Solid	Dry and Grind	
160-30732-3	PE2-RSYD11-DC-S003	Total/NA	Solid	Dry and Grind	
160-30732-4	PE2-RSYD11-DC-S004	Total/NA	Solid	Dry and Grind	
160-30732-5	PE2-RSYD11-DC-S005	Total/NA	Solid	Dry and Grind	
160-30732-6	PE2-RSYD11-DC-S006	Total/NA	Solid	Dry and Grind	
160-30732-7	PE2-RSYD11-DC-S007	Total/NA	Solid	Dry and Grind	
160-30732-8	PE2-RSYD11-DC-S008	Total/NA	Solid	Dry and Grind	
160-30732-9	PE2-RSYD11-DC-S009	Total/NA	Solid	Dry and Grind	
160-30732-10	PE2-RSYD11-DC-S010	Total/NA	Solid	Dry and Grind	
160-30732-11	PE2-RSYD11-DC-S011	Total/NA	Solid	Dry and Grind	
160-30732-12	PE2-RSYD11-DC-S012	Total/NA	Solid	Dry and Grind	
160-30732-13	PE2-RSYD11-DC-S013	Total/NA	Solid	Dry and Grind	
160-30732-14	PE2-RSYD11-DC-S014	Total/NA	Solid	Dry and Grind	
160-30732-15	PE2-RSYD11-DC-S015	Total/NA	Solid	Dry and Grind	
160-30732-16	PE2-RSYD11-DC-S016	Total/NA	Solid	Dry and Grind	
160-30732-17	PE2-RSYD11-DC-S017	Total/NA	Solid	Dry and Grind	
160-30732-18	PE2-RSYD11-DC-S018	Total/NA	Solid	Dry and Grind	
160-30732-1 DU	PE2-RSYD11-DC-S001	Total/NA	Solid	Dry and Grind	

Prep Batch: 389963

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-30732-1	PE2-RSYD11-DC-S001	Total/NA	Solid	Fill_Geo-21	389249
160-30732-2	PE2-RSYD11-DC-S002	Total/NA	Solid	Fill_Geo-21	389249
160-30732-3	PE2-RSYD11-DC-S003	Total/NA	Solid	Fill_Geo-21	389249
160-30732-4	PE2-RSYD11-DC-S004	Total/NA	Solid	Fill_Geo-21	389249
160-30732-5	PE2-RSYD11-DC-S005	Total/NA	Solid	Fill_Geo-21	389249
160-30732-6	PE2-RSYD11-DC-S006	Total/NA	Solid	Fill_Geo-21	389249
160-30732-7	PE2-RSYD11-DC-S007	Total/NA	Solid	Fill_Geo-21	389249
160-30732-8	PE2-RSYD11-DC-S008	Total/NA	Solid	Fill_Geo-21	389249
160-30732-9	PE2-RSYD11-DC-S009	Total/NA	Solid	Fill_Geo-21	389249
160-30732-10	PE2-RSYD11-DC-S010	Total/NA	Solid	Fill_Geo-21	389249
160-30732-11	PE2-RSYD11-DC-S011	Total/NA	Solid	Fill_Geo-21	389249
160-30732-12	PE2-RSYD11-DC-S012	Total/NA	Solid	Fill_Geo-21	389249
160-30732-13	PE2-RSYD11-DC-S013	Total/NA	Solid	Fill_Geo-21	389249
160-30732-14	PE2-RSYD11-DC-S014	Total/NA	Solid	Fill_Geo-21	389249
160-30732-15	PE2-RSYD11-DC-S015	Total/NA	Solid	Fill_Geo-21	389249
160-30732-16	PE2-RSYD11-DC-S016	Total/NA	Solid	Fill_Geo-21	389249
160-30732-17	PE2-RSYD11-DC-S017	Total/NA	Solid	Fill_Geo-21	389249
160-30732-18	PE2-RSYD11-DC-S018	Total/NA	Solid	Fill_Geo-21	389249
MB 160-389963/1-A	Method Blank	Total/NA	Solid	Fill_Geo-21	
LCS 160-389963/2-A	Lab Control Sample	Total/NA	Solid	Fill_Geo-21	
160-30732-1 DU	PE2-RSYD11-DC-S001	Total/NA	Solid	Fill_Geo-21	389249

Prep Batch: 390125

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-30732-1	PE2-RSYD11-DC-S001	Total/NA	Solid	DPS-0	389249
160-30732-11	PE2-RSYD11-DC-S011	Total/NA	Solid	DPS-0	389249
MB 160-390125/10-A	Method Blank	Total/NA	Solid	DPS-0	
LCS 160-390125/1-A	Lab Control Sample	Total/NA	Solid	DPS-0	
160-30732-1 DU	PE2-RSYD11-DC-S001	Total/NA	Solid	DPS-0	389249

Tracer/Carrier Summary

Client: Aptim Federal Services LLC

Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-30732-2

Method: 905.0 - Total Beta Strontium (GFPC)

Matrix: Solid

Prep Type: Total/NA

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Sr Carrier (40-110)	
160-30732-1	PE2-RSYD11-DC-S001	88.5	
160-30732-1 DU	PE2-RSYD11-DC-S001	88.7	
160-30732-11	PE2-RSYD11-DC-S011	82.7	
LCS 160-390125/1-A	Lab Control Sample	84.3	
MB 160-390125/10-A	Method Blank	68.7	

Tracer/Carrier Legend

Sr Carrier = Sr Carrier

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica St. Louis
13715 Rider Trail North
Earth City, MO 63045
Tel: (314)298-8566

TestAmerica Job ID: 160-31048-2

Client Project/Site: Hunters Point Naval Shipyard - Parcel E2

For:

Aptim Federal Services LLC
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Attn: Eddie Kalombo

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Case Narrative

Client: Optim Federal Services LLC

Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-31048-2

Job ID: 160-31048-2

Laboratory: TestAmerica St. Louis

Narrative

CASE NARRATIVE

Client: Optim Federal Services LLC

Project: Hunters Point Naval Shipyard - Parcel E2

Report Number: 160-31048-2

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

TestAmerica St. Louis attests to the validity of the laboratory data generated by TestAmerica facilities reported herein. All analyses performed by TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the application methods. TestAmerica's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

All solid sample results for Chemistry analyses are reported on an "as received" basis unless otherwise indicated by the presence of a % solids value in the method header. All soil/sediment sample results for radiochemistry analyses are based upon sample as dried and disaggregated with the exception of tritium, carbon-14, and iodine-129 by gamma spectroscopy unless requested as wet weight by the client.

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative.

Reference the chain of custody and condition upon receipt report for any variations on receipt conditions and temperature of samples on receipt.

Manual Integrations were performed only when necessary and are in compliance with the laboratory's standard operating procedure. Detailed information can be found in the raw data section of the level IV report.

The following clean-up methods for Organic analyses may have been used on the samples in this data set. Specific methods employed are documented on the batch extraction logs:

Method 3600C: Cleanup

Method 3620C: Florisil Cleanup

Method 3630C: Silica Gel Cleanup

Method 3640A: Gel-Permeation Cleanup

Method 3650B: Acid-Base Partition Cleanup

Method 3660B: Sulfur Cleanup

Method 3665A: Sulfuric Acid/Permanganate Cleanup

Case Narrative

Client: Aptim Federal Services LLC

Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-31048-2

Job ID: 160-31048-2 (Continued)

Laboratory: TestAmerica St. Louis (Continued)

This laboratory report is confidential and is intended for the sole use of TestAmerica and its client.

RECEIPT

The samples were received on 10/02/2018; the samples arrived in good condition, properly preserved. The temperature of the coolers at receipt was 19.0° C.

TOTAL BETA STRONTIUM (GFPC)

Sample PE2-RSYD11-DC-B-S001 (160-31048-1) was analyzed for Total Beta Strontium (GFPC) in accordance with EPA 905. The samples were dried on 10/02/2018, prepared on 10/07/2018 and analyzed on 10/25/2018.

The following sample in batch 160-393536 could not be thoroughly homogenized before sub-sampling was performed due to sample matrix: PE2-RSYD11-DC-B-S001 (160-31048-1). The sample contained detritus material and rocks of varying sizes.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

RADIUM-226 BY GAMMA SPEC (21 DAY INGROWTH)

Samples PE2-RSYD11-DC-B-S001 (160-31048-1), PE2-RSYD11-DC-B-S002 (160-31048-2), PE2-RSYD11-DC-B-S003 (160-31048-3), PE2-RSYD11-DC-B-S004 (160-31048-4), PE2-RSYD11-DC-B-S005 (160-31048-5), PE2-RSYD11-DC-B-S006 (160-31048-6) and PE2-RSYD11-DC-B-S007 (160-31048-7) were analyzed for Radium-226 by gamma spec (21 day ingrowth) in accordance with EPA GA_01_R. The samples were dried on 10/02/2018, prepared on 10/03/2018 and analyzed on 10/25/2018.

The cesium-137 detection goal of 0.0700 pCi/g was not met for samples PE2-RSYD11-DC-B-S004 (160-31048-4) and PE2-RSYD11-DC-B-S007 (160-31048-7) in batch 160-392879. This is caused by statistical fluctuations in the Compton background due to low level activity in the samples in conjunction with the software attempting to fit a peak into the noise of this baseline.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.



CHAIN OF CUSTODY

APTIM

4005 Port Chicago Hwy
Concord, Ca 94520

Project Number: 500506

CTO-013 RSYD11 Deconstruction

biased sample

Project Name: HPNS - Parcel E-2

Project Location: Purchase Order #: 202296

Shipment/Pickup Date: 10/1/18

Waybill Number: 12645451395457557

Lab Destination: TestAmerica (St. Louis Lab)

13715 Rider Trail North

Earth City, MO 63045

Send Report To: Eddie Kalombo

Phone/Fax Number: 415-987-0760

Address: #005 Port Chicago Hwy

City: Concord, CA, 94520

Sampler's Name(s):

Sample ID Number	Sample Description	Date	Time	Method	Collection Information		Preservative (soil)	Preservative (water)	Container Type	# Containers	# of Samples	Container Type	# Containers	# of Samples	Preservative (soil)	Preservative (water)	Container Type	# Containers	# of Samples	Preservative (soil)	Preservative (water)	Container Type	# Containers	# of Samples	
					Start Date	End Date																			
PE2-RSYD11-DC-B-S001	Parcel E-2 RSYD11 Biased	9/26/18	12:15	G	SO	1	16 oz. plastic jar	X	X	X	1	1	Parcel E-2 RSYD11 Biased	9/26/18	12:22	G	SO	1	16 oz. plastic jar	X	X	X	1	1	5
PE2-RSYD11-DC-B-S002	Parcel E-2 RSYD11 Biased	9/26/18	12:22	G	SO	1	16 oz. plastic jar	X	X	X	1	1	Parcel E-2 RSYD11 Biased	9/26/18	12:28	G	SO	1	16 oz. plastic jar	X	X	X	1	1	5
PE2-RSYD11-DC-B-S003	Parcel E-2 RSYD11 Biased	9/26/18	12:28	G	SO	1	16 oz. plastic jar	X	X	X	1	1	Parcel E-2 RSYD11 Biased	9/26/18	12:34	G	SO	1	16 oz. plastic jar	X	X	X	1	1	5
PE2-RSYD11-DC-B-S004	Parcel E-2 RSYD11 Biased	9/26/18	12:40	G	SO	1	16 oz. plastic jar	X	X	X	1	1	Parcel E-2 RSYD11 Biased	9/26/18	12:46	G	SO	1	16 oz. plastic jar	X	X	X	1	1	5
PE2-RSYD11-DC-B-S005	Parcel E-2 RSYD11 Biased	9/26/18	12:46	G	SO	1	16 oz. plastic jar	X	X	X	1	1	Parcel E-2 RSYD11 Biased	9/26/18	12:53	G	SO	1	16 oz. plastic jar	X	X	X	1	1	5
PE2-RSYD11-DC-B-S006	Parcel E-2 RSYD11 Biased																								
PE2-RSYD11-DC-B-S007	Parcel E-2 RSYD11 Biased																								

Special Instructions:

Analyze for Total Strontium as a screening step, and Isotopic Sr-90 only if Total Strontium is above project action limit of 0.331 pCi/g.

Standard TAT -10-day	24-hr	3 day	10 day	Level Of QC Required:		Project Specific:	Method Codes	Matrix Codes	G = Grab
				I	II				
Relinquished By: <i>Eddie Kalombo</i>	Date: 10/1/18 Time: 1000	Date: 10/1/18 Time: 1000	Date: 10/1/18 Time: 1000	Received By: <i>Micheal Shum</i>	Received By: <i>Karen Bo</i>	Date: 10/1/18 Time: 1000	Date: 10/1/18 Time: 1000	Date: 10/1/18 Time: 0840	Date: 10/1/18 Time: 0840
Relinquished By: <i>Eddie Kalombo</i>	Date: 10/1/18 Time: 1600	Date: 10/1/18 Time: 1600	Date: 10/1/18 Time: 1600	Received By: <i>Micheal Shum</i>	Received By: <i>Karen Bo</i>	Date: 10/1/18 Time: 1600	Date: 10/1/18 Time: 1600	Date: 10/1/18 Time: 0840	Date: 10/1/18 Time: 0840
Relinquished By: <i>Eddie Kalombo</i>	Date: 10/1/18 Time: 1600	Date: 10/1/18 Time: 1600	Date: 10/1/18 Time: 1600	Received By: <i>Micheal Shum</i>	Received By: <i>Karen Bo</i>	Date: 10/1/18 Time: 1600	Date: 10/1/18 Time: 1600	Date: 10/1/18 Time: 0840	Date: 10/1/18 Time: 0840

160-31048 Chain of Custody

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4005 Port Chicago Hwy
Concord, Ca 94520

Ref. Document # PE2_RSYD11_DC_BIASED#622
Page 1 of 1

Login Sample Receipt Checklist

Client: Aptim Federal Services LLC

Job Number: 160-31048-2

Login Number: 31048**List Number: 1****Creator: Press, Nicholas B****List Source: TestAmerica St. Louis**

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Definitions/Glossary

Client: Aptim Federal Services LLC

Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-31048-2

Qualifiers

Rad

Qualifier	Qualifier Description
U	Undetected at the Limit of Detection.

Glossary

Abbreviation

These commonly used abbreviations may or may not be present in this report.

□	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Method Summary

Client: Aptim Federal Services LLC

Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-31048-2

Method	Method Description	Protocol	Laboratory
905.0	Total Beta Strontium (GFPC)	DOE	TAL SL
GA-01-R	Radium-226 & Other Gamma Emitters (GS)	DOE	TAL SL
DPS-0	Preparation, Digestion/ Precipitate	None	TAL SL
Dry and Grind	Preparation, Dry and Grind	None	TAL SL
Fill_Geo-21	Fill Geometry, 21-Day In-Growth	None	TAL SL

Protocol References:

DOE = U.S. Department of Energy

None = None

Laboratory References:

TAL SL = TestAmerica St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

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Sample Summary

Client: Aptim Federal Services LLC

Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-31048-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
160-31048-1	PE2-RSYD11-DC-B-S001	Solid	09/26/18 12:15	10/02/18 08:40
160-31048-2	PE2-RSYD11-DC-B-S002	Solid	09/26/18 12:22	10/02/18 08:40
160-31048-3	PE2-RSYD11-DC-B-S003	Solid	09/26/18 12:28	10/02/18 08:40
160-31048-4	PE2-RSYD11-DC-B-S004	Solid	09/26/18 12:34	10/02/18 08:40
160-31048-5	PE2-RSYD11-DC-B-S005	Solid	09/26/18 12:40	10/02/18 08:40
160-31048-6	PE2-RSYD11-DC-B-S006	Solid	09/26/18 12:46	10/02/18 08:40
160-31048-7	PE2-RSYD11-DC-B-S007	Solid	09/26/18 12:53	10/02/18 08:40

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Client Sample Results

Client: Aptim Federal Services LLC

Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-31048-2

Client Sample ID: PE2-RSYD11-DC-B-S001**Lab Sample ID: 160-31048-1**

Date Collected: 09/26/18 12:15

Matrix: Solid

Date Received: 10/02/18 08:40

Method: 905.0 - Total Beta Strontium (GFPC)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Total Beta Strontium	-0.000659	U	0.0650	0.0650	0.331	0.0535	pCi/g	10/07/18 13:14	10/25/18 05:45	1
Carrier	%Yield	Qualifier	Limits					Prepared	Analyzed	Dil Fac
Sr Carrier	85.9		40 - 110					10/07/18 13:14	10/25/18 05:45	1

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Actinium 228	0.700		0.168	0.182		0.0577	pCi/g	10/03/18 12:58	10/25/18 11:59	1
Actinium-227	-0.0564	U	0.661	0.662		0.392	pCi/g	10/03/18 12:58	10/25/18 11:59	1
Bismuth-212	-0.662	U	0.895	0.898		0.818	pCi/g	10/03/18 12:58	10/25/18 11:59	1
Bismuth-214	0.724		0.179	0.194		0.0633	pCi/g	10/03/18 12:58	10/25/18 11:59	1
Cesium-137	0.0181	U	0.0722	0.0722	0.0700	0.0578	pCi/g	10/03/18 12:58	10/25/18 11:59	1
Cobalt-60	-0.00465	U	0.0580	0.0580	0.200	0.0335	pCi/g	10/03/18 12:58	10/25/18 11:59	1
Lead-210	0.455	U	1.59	1.59		1.29	pCi/g	10/03/18 12:58	10/25/18 11:59	1
Lead-212	0.749		0.109	0.146		0.0468	pCi/g	10/03/18 12:58	10/25/18 11:59	1
Lead-214	0.697		0.118	0.139		0.0568	pCi/g	10/03/18 12:58	10/25/18 11:59	1
Potassium-40	18.2		1.96	2.71		0.224	pCi/g	10/03/18 12:58	10/25/18 11:59	1
Protactinium-231	0.000	U	0.675	0.675		2.51	pCi/g	10/03/18 12:58	10/25/18 11:59	1
Radium-226	0.724		0.179	0.194	0.700	0.0633	pCi/g	10/03/18 12:58	10/25/18 11:59	1
Radium-228	0.700		0.168	0.182		0.0577	pCi/g	10/03/18 12:58	10/25/18 11:59	1
Thallium-208	0.202		0.0842	0.0868		0.0370	pCi/g	10/03/18 12:58	10/25/18 11:59	1
Thorium-228	0.749		0.109	0.146		0.0468	pCi/g	10/03/18 12:58	10/25/18 11:59	1
Thorium-232	0.700		0.168	0.182		0.0577	pCi/g	10/03/18 12:58	10/25/18 11:59	1
Thorium-234	0.560		0.571	0.574		0.511	pCi/g	10/03/18 12:58	10/25/18 11:59	1
Uranium-235	0.178	U	0.363	0.364		0.307	pCi/g	10/03/18 12:58	10/25/18 11:59	1
Uranium-238	0.560		0.571	0.574		0.511	pCi/g	10/03/18 12:58	10/25/18 11:59	1

Client Sample ID: PE2-RSYD11-DC-B-S002**Lab Sample ID: 160-31048-2**

Date Collected: 09/26/18 12:22

Matrix: Solid

Date Received: 10/02/18 08:40

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			Uncert. (2σ+/-)	Uncert. (2σ+/-)						
Actinium 228	1.08		0.424	0.437		0.167	pCi/g	10/03/18 12:58	10/25/18 10:46	1
Actinium-227	0.00787	U	0.975	0.975		0.607	pCi/g	10/03/18 12:58	10/25/18 10:46	1
Bismuth-212	0.372	U	1.40	1.40		1.12	pCi/g	10/03/18 12:58	10/25/18 10:46	1
Bismuth-214	1.42		0.274	0.310		0.0931	pCi/g	10/03/18 12:58	10/25/18 10:46	1
Cesium-137	0.0505	U	0.0859	0.0861	0.0700	0.0658	pCi/g	10/03/18 12:58	10/25/18 10:46	1
Cobalt-60	0.0248	U	0.0771	0.0772	0.200	0.0566	pCi/g	10/03/18 12:58	10/25/18 10:46	1
Lead-210	2.48		2.35	2.37		1.56	pCi/g	10/03/18 12:58	10/25/18 10:46	1
Lead-212	1.02		0.172	0.202		0.0878	pCi/g	10/03/18 12:58	10/25/18 10:46	1
Lead-214	1.60		0.236	0.286		0.0736	pCi/g	10/03/18 12:58	10/25/18 10:46	1
Potassium-40	14.7		2.14	2.60		0.442	pCi/g	10/03/18 12:58	10/25/18 10:46	1
Protactinium-231	0.000	U	0.907	0.907		3.92	pCi/g	10/03/18 12:58	10/25/18 10:46	1

Client Sample Results

Client: Aptim Federal Services LLC

Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-31048-2

Client Sample ID: PE2-RSYD11-DC-B-S002**Lab Sample ID: 160-31048-2**

Date Collected: 09/26/18 12:22

Matrix: Solid

Date Received: 10/02/18 08:40

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS) (Continued)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Radium-226	1.42		0.274	0.310	0.700	0.0931	pCi/g	10/03/18 12:58	10/25/18 10:46	1
Radium-228	1.08		0.424	0.437		0.167	pCi/g	10/03/18 12:58	10/25/18 10:46	1
Thallium-208	0.460		0.0955	0.106		0.0195	pCi/g	10/03/18 12:58	10/25/18 10:46	1
Thorium-228	1.02		0.172	0.202		0.0878	pCi/g	10/03/18 12:58	10/25/18 10:46	1
Thorium-232	1.08		0.424	0.437		0.167	pCi/g	10/03/18 12:58	10/25/18 10:46	1
Thorium-234	2.00		1.20	1.22		0.680	pCi/g	10/03/18 12:58	10/25/18 10:46	1
Uranium-235	0.000	U	0.395	0.395		0.755	pCi/g	10/03/18 12:58	10/25/18 10:46	1
Uranium-238	2.00		1.20	1.22		0.680	pCi/g	10/03/18 12:58	10/25/18 10:46	1

Client Sample ID: PE2-RSYD11-DC-B-S003**Lab Sample ID: 160-31048-3**

Date Collected: 09/26/18 12:28

Matrix: Solid

Date Received: 10/02/18 08:40

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Actinium 228	1.03		0.257	0.278		0.0781	pCi/g	10/03/18 12:58	10/25/18 11:21	1
Actinium-227	0.00793	U	0.902	0.902		0.561	pCi/g	10/03/18 12:58	10/25/18 11:21	1
Bismuth-212	0.289	U	1.52	1.52		1.24	pCi/g	10/03/18 12:58	10/25/18 11:21	1
Bismuth-214	1.30		0.238	0.272		0.0823	pCi/g	10/03/18 12:58	10/25/18 11:21	1
Cesium-137	0.0403	U	0.0713	0.0714	0.0700	0.0549	pCi/g	10/03/18 12:58	10/25/18 11:21	1
Cobalt-60	0.0405		0.0703	0.0704	0.200	0.0315	pCi/g	10/03/18 12:58	10/25/18 11:21	1
Lead-210	1.49		2.20	2.21		1.39	pCi/g	10/03/18 12:58	10/25/18 11:21	1
Lead-212	0.864		0.143	0.169		0.0725	pCi/g	10/03/18 12:58	10/25/18 11:21	1
Lead-214	1.31		0.184	0.227		0.0692	pCi/g	10/03/18 12:58	10/25/18 11:21	1
Potassium-40	15.7		1.90	2.47		0.133	pCi/g	10/03/18 12:58	10/25/18 11:21	1
Protactinium-231	0.384	U	2.22	2.22		3.44	pCi/g	10/03/18 12:58	10/25/18 11:21	1
Radium-226	1.30		0.238	0.272	0.700	0.0823	pCi/g	10/03/18 12:58	10/25/18 11:21	1
Radium-228	1.03		0.257	0.278		0.0781	pCi/g	10/03/18 12:58	10/25/18 11:21	1
Thallium-208	0.375		0.0926	0.100		0.0337	pCi/g	10/03/18 12:58	10/25/18 11:21	1
Thorium-228	0.864		0.143	0.169		0.0725	pCi/g	10/03/18 12:58	10/25/18 11:21	1
Thorium-232	1.03		0.257	0.278		0.0781	pCi/g	10/03/18 12:58	10/25/18 11:21	1
Thorium-234	1.14		0.862	0.872		0.656	pCi/g	10/03/18 12:58	10/25/18 11:21	1
Uranium-235	-0.316	U	0.441	0.442		0.706	pCi/g	10/03/18 12:58	10/25/18 11:21	1
Uranium-238	1.14		0.862	0.872		0.656	pCi/g	10/03/18 12:58	10/25/18 11:21	1

Client Sample ID: PE2-RSYD11-DC-B-S004**Lab Sample ID: 160-31048-4**

Date Collected: 09/26/18 12:34

Matrix: Solid

Date Received: 10/02/18 08:40

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.934		0.240	0.259		0.0940	pCi/g	10/03/18 12:58	10/25/18 12:32	1
Actinium-227	0.110	U	0.195	0.196		0.541	pCi/g	10/03/18 12:58	10/25/18 12:32	1
Bismuth-212	0.399	U	0.801	0.802		0.611	pCi/g	10/03/18 12:58	10/25/18 12:32	1

Client Sample Results

Client: Aptim Federal Services LLC

Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-31048-2

Client Sample ID: PE2-RSYD11-DC-B-S004

Date Collected: 09/26/18 12:34

Date Received: 10/02/18 08:40

Lab Sample ID: 160-31048-4

Matrix: Solid

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS) (Continued)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Bismuth-214	0.778		0.183	0.200		0.0677	pCi/g	10/03/18 12:58	10/25/18 12:32	1
Cesium-137	-0.0952	U	0.116	0.116	0.0700	0.106	pCi/g	10/03/18 12:58	10/25/18 12:32	1
Cobalt-60	0.0350	U	0.0215	0.0218	0.200	0.0673	pCi/g	10/03/18 12:58	10/25/18 12:32	1
Lead-210	-0.121	U	1.60	1.60		1.14	pCi/g	10/03/18 12:58	10/25/18 12:32	1
Lead-212	0.847		0.139	0.177		0.0631	pCi/g	10/03/18 12:58	10/25/18 12:32	1
Lead-214	0.697		0.163	0.179		0.100	pCi/g	10/03/18 12:58	10/25/18 12:32	1
Potassium-40	16.1		2.19	2.74		0.270	pCi/g	10/03/18 12:58	10/25/18 12:32	1
Protactinium-231	0.000	U	0.289	0.289		2.47	pCi/g	10/03/18 12:58	10/25/18 12:32	1
Radium-226	0.778		0.183	0.200	0.700	0.0677	pCi/g	10/03/18 12:58	10/25/18 12:32	1
Radium-228	0.934		0.240	0.259		0.0940	pCi/g	10/03/18 12:58	10/25/18 12:32	1
Thallium-208	0.319		0.0965	0.102		0.0350	pCi/g	10/03/18 12:58	10/25/18 12:32	1
Thorium-228	0.847		0.139	0.177		0.0631	pCi/g	10/03/18 12:58	10/25/18 12:32	1
Thorium-232	0.934		0.240	0.259		0.0940	pCi/g	10/03/18 12:58	10/25/18 12:32	1
Thorium-234	1.16		0.698	0.710		0.481	pCi/g	10/03/18 12:58	10/25/18 12:32	1
Uranium-235	0.162	U	0.288	0.289		0.373	pCi/g	10/03/18 12:58	10/25/18 12:32	1
Uranium-238	1.16		0.698	0.710		0.481	pCi/g	10/03/18 12:58	10/25/18 12:32	1

Client Sample ID: PE2-RSYD11-DC-B-S005

Date Collected: 09/26/18 12:40

Date Received: 10/02/18 08:40

Lab Sample ID: 160-31048-5

Matrix: Solid

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.586		0.185	0.194		0.0719	pCi/g	10/03/18 12:58	10/25/18 11:49	1
Actinium-227	-0.0765	U	1.01	1.01		0.346	pCi/g	10/03/18 12:58	10/25/18 11:49	1
Bismuth-212	1.45		0.401	0.428		0.0648	pCi/g	10/03/18 12:58	10/25/18 11:49	1
Bismuth-214	0.658		0.138	0.154		0.0482	pCi/g	10/03/18 12:58	10/25/18 11:49	1
Cesium-137	0.000	U	0.0112	0.0112	0.0700	0.0366	pCi/g	10/03/18 12:58	10/25/18 11:49	1
Cobalt-60	-0.000471	U	0.0796	0.0796	0.200	0.0325	pCi/g	10/03/18 12:58	10/25/18 11:49	1
Lead-210	0.271	U	1.41	1.41		1.15	pCi/g	10/03/18 12:58	10/25/18 11:49	1
Lead-212	0.818		0.0991	0.145		0.0424	pCi/g	10/03/18 12:58	10/25/18 11:49	1
Lead-214	0.659		0.113	0.132		0.0483	pCi/g	10/03/18 12:58	10/25/18 11:49	1
Potassium-40	18.5		1.61	2.49		0.234	pCi/g	10/03/18 12:58	10/25/18 11:49	1
Protactinium-231	0.000	U	0.647	0.647		2.10	pCi/g	10/03/18 12:58	10/25/18 11:49	1
Radium-226	0.658		0.138	0.154	0.700	0.0482	pCi/g	10/03/18 12:58	10/25/18 11:49	1
Radium-228	0.586		0.185	0.194		0.0719	pCi/g	10/03/18 12:58	10/25/18 11:49	1
Thallium-208	0.263		0.0616	0.0673		0.0236	pCi/g	10/03/18 12:58	10/25/18 11:49	1
Thorium-228	0.818		0.0991	0.145		0.0424	pCi/g	10/03/18 12:58	10/25/18 11:49	1
Thorium-232	0.586		0.185	0.194		0.0719	pCi/g	10/03/18 12:58	10/25/18 11:49	1
Thorium-234	0.503	U	0.796	0.798		0.768	pCi/g	10/03/18 12:58	10/25/18 11:49	1
Uranium-235	0.138	U	0.241	0.242		0.413	pCi/g	10/03/18 12:58	10/25/18 11:49	1
Uranium-238	0.503	U	0.796	0.798		0.768	pCi/g	10/03/18 12:58	10/25/18 11:49	1

Client Sample Results

Client: Aptim Federal Services LLC

Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-31048-2

Client Sample ID: PE2-RSYD11-DC-B-S006

Date Collected: 09/26/18 12:46

Date Received: 10/02/18 08:40

Lab Sample ID: 160-31048-6

Matrix: Solid

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Actinium 228	0.749		0.362	0.370		0.164	pCi/g	10/03/18 12:58	10/25/18 11:59	1
Actinium-227	0.0749	U	0.155	0.155		0.427	pCi/g	10/03/18 12:58	10/25/18 11:59	1
Bismuth-212	0.0259	U	0.889	0.889		0.730	pCi/g	10/03/18 12:58	10/25/18 11:59	1
Bismuth-214	0.821		0.161	0.182		0.0552	pCi/g	10/03/18 12:58	10/25/18 11:59	1
Cesium-137	0.0281	U	0.0524	0.0525	0.0700	0.0403	pCi/g	10/03/18 12:58	10/25/18 11:59	1
Cobalt-60	-0.0564	U	0.119	0.119	0.200	0.0567	pCi/g	10/03/18 12:58	10/25/18 11:59	1
Lead-210	1.40		1.78	1.79		1.13	pCi/g	10/03/18 12:58	10/25/18 11:59	1
Lead-212	0.757		0.120	0.144		0.0609	pCi/g	10/03/18 12:58	10/25/18 11:59	1
Lead-214	0.873		0.148	0.173		0.0659	pCi/g	10/03/18 12:58	10/25/18 11:59	1
Potassium-40	19.1		1.88	2.69		0.107	pCi/g	10/03/18 12:58	10/25/18 11:59	1
Protactinium-231	-0.930	U	3.41	3.42		2.79	pCi/g	10/03/18 12:58	10/25/18 11:59	1
Radium-226	0.821		0.161	0.182	0.700	0.0552	pCi/g	10/03/18 12:58	10/25/18 11:59	1
Radium-228	0.749		0.362	0.370		0.164	pCi/g	10/03/18 12:58	10/25/18 11:59	1
Thallium-208	0.344		0.0789	0.0863		0.0257	pCi/g	10/03/18 12:58	10/25/18 11:59	1
Thorium-228	0.757		0.120	0.144		0.0609	pCi/g	10/03/18 12:58	10/25/18 11:59	1
Thorium-232	0.749		0.362	0.370		0.164	pCi/g	10/03/18 12:58	10/25/18 11:59	1
Thorium-234	-0.168	U	1.21	1.21		1.00	pCi/g	10/03/18 12:58	10/25/18 11:59	1
Uranium-235	0.0750	U	0.338	0.338		0.537	pCi/g	10/03/18 12:58	10/25/18 11:59	1
Uranium-238	-0.168	U	1.21	1.21		1.00	pCi/g	10/03/18 12:58	10/25/18 11:59	1

Client Sample ID: PE2-RSYD11-DC-B-S007

Date Collected: 09/26/18 12:53

Date Received: 10/02/18 08:40

Lab Sample ID: 160-31048-7

Matrix: Solid

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count	Total	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
			(2σ+/-)	(2σ+/-)						
Actinium 228	1.26		0.252	0.283		0.129	pCi/g	10/03/18 12:58	10/25/18 12:31	1
Actinium-227	0.365	U	0.777	0.779		0.557	pCi/g	10/03/18 12:58	10/25/18 12:31	1
Bismuth-212	-0.0663	U	1.15	1.15		0.967	pCi/g	10/03/18 12:58	10/25/18 12:31	1
Bismuth-214	1.33		0.216	0.256		0.0468	pCi/g	10/03/18 12:58	10/25/18 12:31	1
Cesium-137	-0.0809	U	0.129	0.130	0.0700	0.0777	pCi/g	10/03/18 12:58	10/25/18 12:31	1
Cobalt-60	-0.00861	U	0.107	0.107	0.200	0.0588	pCi/g	10/03/18 12:58	10/25/18 12:31	1
Lead-210	-1.36	U	1.34	1.35		2.35	pCi/g	10/03/18 12:58	10/25/18 12:31	1
Lead-212	0.913		0.138	0.182		0.0564	pCi/g	10/03/18 12:58	10/25/18 12:31	1
Lead-214	1.43		0.232	0.276		0.0802	pCi/g	10/03/18 12:58	10/25/18 12:31	1
Potassium-40	12.7		2.43	2.75		0.816	pCi/g	10/03/18 12:58	10/25/18 12:31	1
Protactinium-231	0.000	U	0.691	0.692		3.55	pCi/g	10/03/18 12:58	10/25/18 12:31	1
Radium-226	1.33		0.216	0.256	0.700	0.0468	pCi/g	10/03/18 12:58	10/25/18 12:31	1
Radium-228	1.26		0.252	0.283		0.129	pCi/g	10/03/18 12:58	10/25/18 12:31	1
Thallium-208	0.295		0.0926	0.0975		0.0378	pCi/g	10/03/18 12:58	10/25/18 12:31	1
Thorium-228	0.913		0.138	0.182		0.0564	pCi/g	10/03/18 12:58	10/25/18 12:31	1
Thorium-232	1.26		0.252	0.283		0.129	pCi/g	10/03/18 12:58	10/25/18 12:31	1
Thorium-234	1.58		0.972	0.988		0.692	pCi/g	10/03/18 12:58	10/25/18 12:31	1
Uranium-235	0.396		0.367	0.369		0.228	pCi/g	10/03/18 12:58	10/25/18 12:31	1
Uranium-238	1.58		0.972	0.988		0.692	pCi/g	10/03/18 12:58	10/25/18 12:31	1

QC Sample Results

Client: Aptim Federal Services LLC

Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-31048-2

Method: 905.0 - Total Beta Strontium (GFPC)

Lab Sample ID: MB 160-393536/14-A

Matrix: Solid

Analysis Batch: 397304

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 393536

Analyte	MB	MB	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac
	Result	Qualifier								
Total Beta Strontium	0.1546		0.0773	0.0781	0.331	0.0517	pCi/g	10/07/18 13:14	10/25/18 07:00	1
Carrier	MB	MB	%Yield Qualifier	Limits	Prepared	Analyzed	Dil Fac			
	%Yield	Qualifier								
Sr Carrier	84.2			40 - 110	10/07/18 13:14	10/25/18 07:00	1			

Lab Sample ID: LCS 160-393536/1-A

Matrix: Solid

Analysis Batch: 397293

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 393536

Analyte	MB	MB	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	LOQ	DLC	Unit	%Rec.	Limits
	Result	Qualifier									
Total Beta Strontium			8.17	8.226		0.666	0.331	0.0650	pCi/g	101	75 - 125
Carrier	MB	MB	%Yield Qualifier	Limits	Prepared	Analyzed	Dil Fac				
	%Yield	Qualifier									
Sr Carrier	87.2			40 - 110							

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS)

Lab Sample ID: MB 160-392879/1-A

Matrix: Solid

Analysis Batch: 397290

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 392879

Analyte	MB	MB	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	LOQ	DLC	Unit	Prepared	Analyzed	Dil Fac	
	Result	Qualifier									
Actinium 228	0.06907		0.119	0.119		0.0408	pCi/g	10/03/18 12:58	10/25/18 10:42	1	
Actinium-227	-0.3461	U		0.700	0.701	0.418	pCi/g	10/03/18 12:58	10/25/18 10:42	1	
Bismuth-212	-0.03813	U		0.686	0.686	0.560	pCi/g	10/03/18 12:58	10/25/18 10:42	1	
Bismuth-214	0.06799	U		0.0555	0.0559	0.156	pCi/g	10/03/18 12:58	10/25/18 10:42	1	
Cesium-137	-0.002366	U		0.0705	0.0705	0.0578	pCi/g	10/03/18 12:58	10/25/18 10:42	1	
Cobalt-60	0.0000	U		0.0135	0.0135	0.0157	pCi/g	10/03/18 12:58	10/25/18 10:42	1	
Lead-210	1.394		1.65	1.66		1.25	pCi/g	10/03/18 12:58	10/25/18 10:42	1	
Lead-212	-0.06161	U		0.122	0.122	0.112	pCi/g	10/03/18 12:58	10/25/18 10:42	1	
Lead-214	-0.04627	U		0.132	0.132	0.112	pCi/g	10/03/18 12:58	10/25/18 10:42	1	
Potassium-40	0.2039	U		0.838	0.838	0.388	pCi/g	10/03/18 12:58	10/25/18 10:42	1	
Protactinium-231	0.5567	U		1.59	1.59	1.74	pCi/g	10/03/18 12:58	10/25/18 10:42	1	
Radium-226	0.06799	U		0.0555	0.0559	0.700	0.156	pCi/g	10/03/18 12:58	10/25/18 10:42	1
Radium-228	0.06907		0.119	0.119		0.0408	pCi/g	10/03/18 12:58	10/25/18 10:42	1	
Thallium-208	0.02587	U		0.0559	0.0559	0.0303	pCi/g	10/03/18 12:58	10/25/18 10:42	1	
Thorium-228	-0.06161	U		0.122	0.122	0.112	pCi/g	10/03/18 12:58	10/25/18 10:42	1	
Thorium-232	0.06907		0.119	0.119		0.0408	pCi/g	10/03/18 12:58	10/25/18 10:42	1	
Thorium-234	0.2842	U		0.637	0.638	0.422	pCi/g	10/03/18 12:58	10/25/18 10:42	1	
Uranium-235	-0.05831	U		0.339	0.339	0.374	pCi/g	10/03/18 12:58	10/25/18 10:42	1	
Uranium-238	0.2842	U		0.637	0.638	0.422	pCi/g	10/03/18 12:58	10/25/18 10:42	1	

QC Sample Results

Client: Aptim Federal Services LLC

Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-31048-2

Method: GA-01-R - Radium-226 & Other Gamma Emitters (GS) (Continued)

Lab Sample ID: LCS 160-392879/2-A

Matrix: Solid

Analysis Batch: 397283

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 392879

Analyte	Spike Added	LCS		Uncert. (2σ+/-)	Total		%Rec.	Limits
		Result	Qual		LOQ	DLC		
Americium-241	96.8	100.7		10.6		0.571	pCi/g	104 87 - 116
Cesium-137	28.1	27.84		2.98	0.0700	0.103	pCi/g	99 87 - 120
Cobalt-60	12.5	12.44		1.31	0.200	0.0246	pCi/g	99 87 - 115

Lab Sample ID: 160-31048-1 DU

Matrix: Solid

Analysis Batch: 397292

Client Sample ID: PE2-RSYD11-DC-B-S001

Prep Type: Total/NA

Prep Batch: 392879

Analyte	Sample Result	Sample Qual	DU		Uncert. (2σ+/-)	Total		RER	Limit
			Result	Qual		LOQ	DLC		
Actinium 228	0.700		0.6715		0.179		0.0742	pCi/g	0.08 1
Actinium-227	-0.0564	U	0.1456	U	0.536		0.315	pCi/g	0.17 1
Bismuth-212	-0.662	U	0.0000	U	0.520		0.534	pCi/g	0.47 1
Bismuth-214	0.724		0.6548		0.147		0.0448	pCi/g	0.20 1
Cesium-137	0.0181	U	-0.00295	U	0.0584	0.0700	0.0320	pCi/g	0.16 1
Cobalt-60	-0.00465	U	0.02271		0.0404	0.200	0.0183	pCi/g	0.28 1
Lead-210	0.455	U	0.6208	U	1.26		1.01	pCi/g	0.06 1
Lead-212	0.749		0.6276		0.119		0.0391	pCi/g	0.46 1
Lead-214	0.697		0.6483		0.122		0.0586	pCi/g	0.19 1
Potassium-40	18.2		16.12		2.25		0.288	pCi/g	0.42 1
Protactinium-231	0.000	U	-0.4764	U	2.52		2.06	pCi/g	0.15 1
Radium-226	0.724		0.6548		0.147	0.700	0.0448	pCi/g	0.20 1
Radium-228	0.700		0.6715		0.179		0.0742	pCi/g	0.08 1
Thallium-208	0.202		0.2656		0.0600		0.0144	pCi/g	0.43 1
Thorium-228	0.749		0.6276		0.119		0.0391	pCi/g	0.46 1
Thorium-232	0.700		0.6715		0.179		0.0742	pCi/g	0.08 1
Thorium-234	0.560		-0.3859	U	0.481		1.04	pCi/g	0.90 1
Uranium-235	0.178	U	0.1056	U	0.213		0.379	pCi/g	0.13 1
Uranium-238	0.560		-0.3859	U	0.481		1.04	pCi/g	0.90 1

QC Association Summary

Client: Aptim Federal Services LLC

Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-31048-2

Rad**Leach Batch: 392496**

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-31048-1	PE2-RSYD11-DC-B-S001	Total/NA	Solid	Dry and Grind	
160-31048-2	PE2-RSYD11-DC-B-S002	Total/NA	Solid	Dry and Grind	
160-31048-3	PE2-RSYD11-DC-B-S003	Total/NA	Solid	Dry and Grind	
160-31048-4	PE2-RSYD11-DC-B-S004	Total/NA	Solid	Dry and Grind	
160-31048-5	PE2-RSYD11-DC-B-S005	Total/NA	Solid	Dry and Grind	
160-31048-6	PE2-RSYD11-DC-B-S006	Total/NA	Solid	Dry and Grind	
160-31048-7	PE2-RSYD11-DC-B-S007	Total/NA	Solid	Dry and Grind	
160-31048-1 DU	PE2-RSYD11-DC-B-S001	Total/NA	Solid	Dry and Grind	

Prep Batch: 392879

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-31048-1	PE2-RSYD11-DC-B-S001	Total/NA	Solid	Fill_Geo-21	392496
160-31048-2	PE2-RSYD11-DC-B-S002	Total/NA	Solid	Fill_Geo-21	392496
160-31048-3	PE2-RSYD11-DC-B-S003	Total/NA	Solid	Fill_Geo-21	392496
160-31048-4	PE2-RSYD11-DC-B-S004	Total/NA	Solid	Fill_Geo-21	392496
160-31048-5	PE2-RSYD11-DC-B-S005	Total/NA	Solid	Fill_Geo-21	392496
160-31048-6	PE2-RSYD11-DC-B-S006	Total/NA	Solid	Fill_Geo-21	392496
160-31048-7	PE2-RSYD11-DC-B-S007	Total/NA	Solid	Fill_Geo-21	392496
MB 160-392879/1-A	Method Blank	Total/NA	Solid	Fill_Geo-21	
LCS 160-392879/2-A	Lab Control Sample	Total/NA	Solid	Fill_Geo-21	
160-31048-1 DU	PE2-RSYD11-DC-B-S001	Total/NA	Solid	Fill_Geo-21	392496

Prep Batch: 393536

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
160-31048-1	PE2-RSYD11-DC-B-S001	Total/NA	Solid	DPS-0	392496
MB 160-393536/14-A	Method Blank	Total/NA	Solid	DPS-0	
LCS 160-393536/1-A	Lab Control Sample	Total/NA	Solid	DPS-0	

Tracer/Carrier Summary

Client: Aptim Federal Services LLC

Project/Site: Hunters Point Naval Shipyard - Parcel E2

TestAmerica Job ID: 160-31048-2

Method: 905.0 - Total Beta Strontium (GFPC)**Matrix: Solid****Prep Type: Total/NA****Percent Yield (Acceptance Limits)**

Lab Sample ID	Client Sample ID	Sr Carrier (40-110)										
160-31048-1	PE2-RSYD11-DC-B-S001	85.9										
LCS 160-393536/1-A	Lab Control Sample	87.2										
MB 160-393536/14-A	Method Blank	84.2										

Tracer/Carrier Legend

Sr Carrier = Sr Carrier

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